DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED LAUREL TO BRIDGER 100-KV TRANSMISSION PROJECT

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MAY 1985

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR THE PROPOSED

CENTRAL MONTANA 100-kV TRANSMISSION

PROJECT

May 1985

Energy Division
Department of Natural Resources and Conservation
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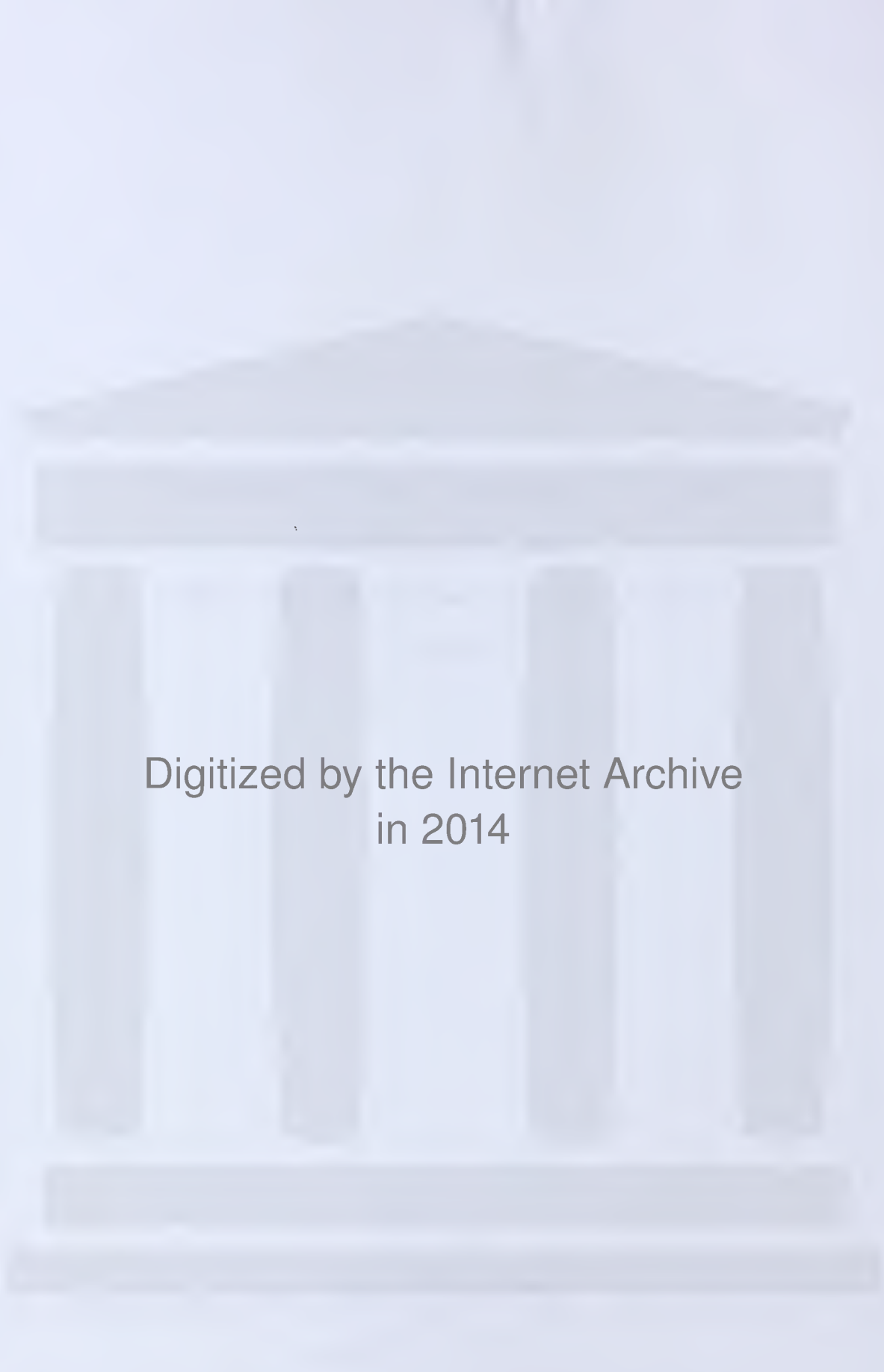
Helena, MT 59620



SUMMARY

In compliance with the Montana Major Facility Siting Act, the Montana Power Company (MPC) has applied for a Certificate of Environmental Compatibility and Public Need for a proposed transmission line. This line would be a 100 kilovolt (kV) transmission line from a substation at Laurel to another substation scheduled for construction about 2 miles northeast of Bridger. MPC indicates in its application that the line is necessary to provide reliable electric service to the growing number of customers in the Bridger-Red Lodge area. At present, this area is served by a 50-kV system that draws power from Mystic Lake Dam west of Red Lodge and from MPC's 100-kV system at Laurel.

The need for the new line stems partly from the unpredictable availability of power from Mystic Lake Dam. The dam facilities do not always operate, either because of unscheduled shutdown or scheduled maintenance. If a major powerline goes down or otherwise becomes inoperable while the Mystic Lake facilities are off-line, voltages drop to unacceptably low levels and service is interupted at some substations.

This susceptibility to outages violates MPC's system reliability criterion. To remedy the problem, MPC plans to build the proposed 100-kV line on a 27-mile route between the Laurel automatic substation and the yet-to-be-built Bridger automatic substation.

DNRC evaluated the benefits of improved reliablity. The benefits were estimated to be at least $2.6 million over the life of the project. The benefits therefore would be greater than the project's projected $2.2 million cost.

MPC and DNRC evaluated various other options for improving system reliability, but none of these was as effective or low in cost as the proposed transmission line. The options considered include other routes for a new transmission line to improve service on the 50-kV loop connecting Laurel-Bridger-Red Lodge-Columbus, and generation options such as combustion turbines, hydropower, wind and solar power, and conservation measures.

The routes evaluated by MPC and DNRC for a transmission line between Laurel and Bridger are shown in Figure 1. MPC and DNRC analysis indicated that none of the routes would cause serious impacts to people or property. The route with the least impact would be MPC's preferred route on the highlands east of the valley floor. This route avoids most cultivated land, residential areas, wildlife habitat, and other potentially sensitive areas.

MPC's preferred route runs along an existing MPC line, called the "A" line, for its entire length, and would be essentially identical to it. The two lines would be as close as 80 feet in some areas.

Like the "A" line, the new line would be built on H-frame wooden structures with a 60-foot right-of-way for most of its length but would use single-pole structures and a 40-foot right-of-way in cultivated areas. Four of the "A" line structures are located on cultivated land, and it is likely that about the same number of structures would be required on cultivated land for the proposed new line.

A major advantage of MPC's preferred route is that it could use the existing "A" line access roads, which would eliminate the need for a new system of access roads, consequently avoiding the impacts associated with such roads.

DNRC'S PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

DNRC's conclusions are based on currently available information, including data from MPC, comments from the public, and decision standards embodied in administrative rules. These conclusions could change if new information is presented after publication of this draft EIS. A public meeting will be held to obtain comments on this document. Written comments will also be accepted from citizens and government agencies receiving copies of the draft EIS.

The proposed recommendations are based on the conclusions, and thus are also subject to change before DNRC makes final recommendations to the Board.

Conclusions

1. Operation of the 50-kV system in the Laurel-Bridger-Red Lodge-Columbus area does not meet MPC's reliability criterion under certain outage conditions.

2. The proposed project, along with upgrading of an existing line from 50-kV to 100-kV and the construction of a new substation near Bridger, would provide the necessary reinforcement to satisfy MPC's reliabilty criterion.

3. The benefits from reduced outages to electric consumers served by the 50-kV system are reasonably likely to exceed the costs of the proposed project.

4. The expected net present value of costs for the proposed facility is less than those of other alternatives that could solve the area's electrical problems.

5. Reasonable alternative locations for siting the transmission line were considered.

6. The facility, constructed along either the applicant's proposed route or the Uplands Route, would not cause major adverse or unmitigable social, economic, natural, or physical environmental impacts if the mitigation measures identified in appendix B are adopted.

7. Construction of the facility along MPC's proposed route would cause the least cumulative environmental impact at less economic cost than other reasonable alternatives. This route provides the best balance of factors to be considered using the Board's preferred route criterion.

8. The facility would not cross any designated National wilderness or primitive area.

9. MPC's proposed project can be constructed to minimize risk to public health and safety from electrical noise, electric fields, or other electrical problems such as shocks and radio and television interference.

10. The route proposed by MPC is wide enough to locate a centerline.

11. DNRC consultation with State Aeronautics and FAA during centerline analysis will be required to determine what markings if any are required for pilot safety at crossings of streams and valleys.

12. DNRC concludes that placing the line underground would not be an economically practical method for reducing potential impacts of the project.

Proposed Recommendations

1. The Board should grant a Certificate of Environmental Compatibility and Public Need to MPC for construction of the Laurel to Bridger 100-kV transmission line.

2. The proposed project should be built on MPC's preferred route.

3. The Board, in approving any route, should attach requirements for reducing or avoiding impacts, including erosion, sedimentation, weeds, and impacts to wildlife, visual, historical, and archaeological resources. These measures are included in DNRC's Transmission Line Construction Specifications, Appendix B.

4. MPC should apply for and the Board should approve a final centerline within the selected route before construction begins, as provided in adopted administrative rules and legislative changes to MFSA. At the time of route certification, work could begin to install additional equipment required at the Laurel and Bridger automatic substations.

5. MPC and DNRC should develop a program for monitoring construction to be submitted for Board consideration at the time of centerline approval.

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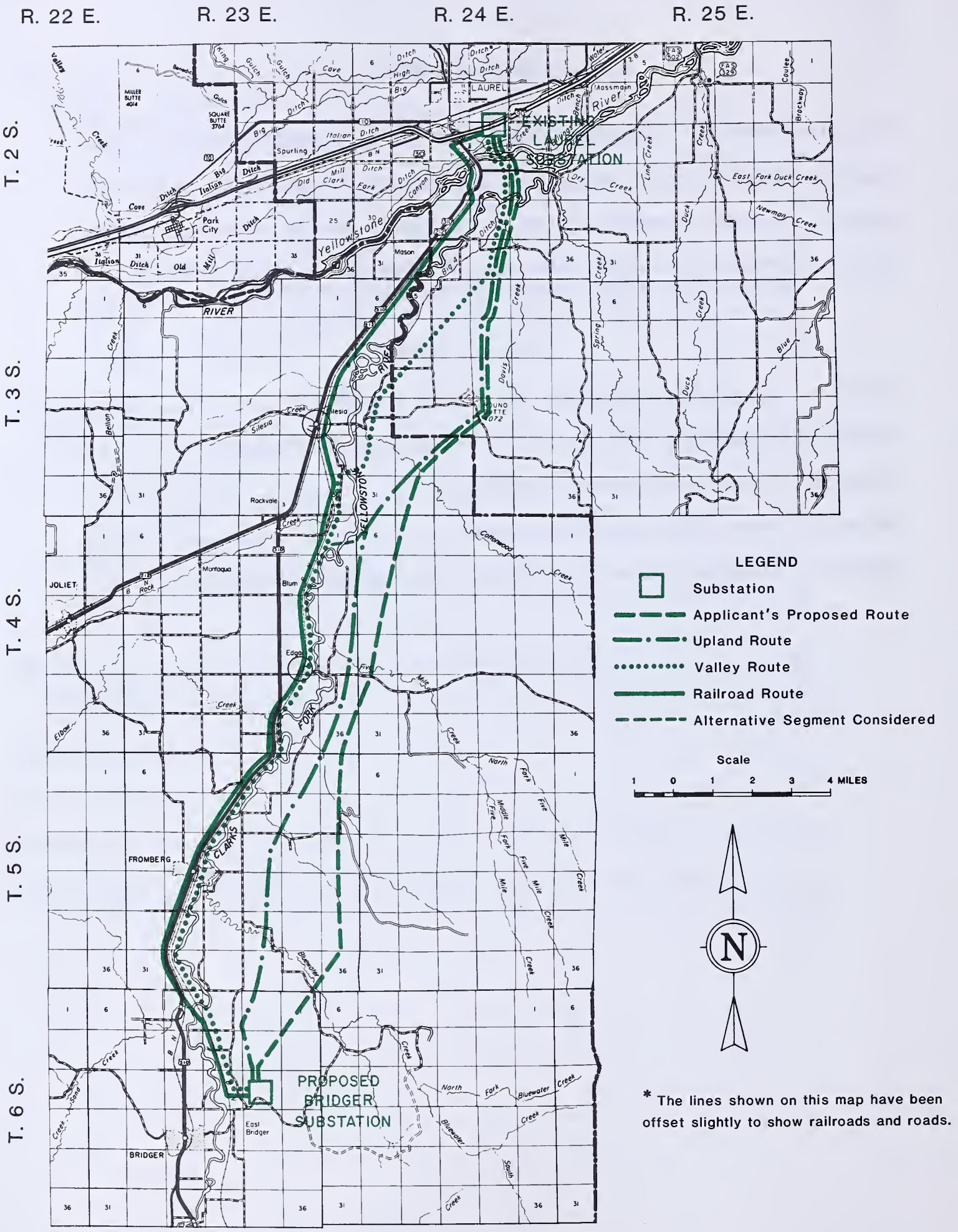


* The lines shown on this map have been offset slightly to show railroads and roads.

FIGURE 1

APPLICANT'S PREFERRED AND ALTERNATE ROUTES *

CHAPTER ONE
INTRODUCTION

This environmental impact statement (EIS) addresses the proposed Laurel-to-Bridger 100-kilovolt (kV) transmission line, for which the Montana Power Company (MPC) filed an application in May, 1984.

This chapter describes the EIS process followed by state agencies under the Montana Major Facility Siting Act and Montana Environmental Policy Act (MEPA). Chapter Two describes the MPC proposal to construct and operate the 100-kV transmission line. Chapter Three presents the Department of Natural Resources and Conservation (DNRC) economic evaluation of the need for the facility and alternatives to it. Chapter Four contains an assessment of social, economic, and environmental impacts likely to result from construction and operation of the project, along with measures to reduce these. Chapter Five compares the applicant's preferred route and the alternative routes. Chapter Six consists of DNRC's preliminary conclusions and recommendations to the Board of Natural Resources and Conservation (Board) which must approve the project before it can be built.

STATE ACTION ON THE PROPOSED PROJECT

Requirements of the Board of Natural Resources and Conservation

The Siting Act requires a comprehensive review of proposals to construct and operate certain kinds of facilities for transmitting, generating, or converting energy in Montana. Transmission facilities more than 10 miles long and operating at voltages greater than 69-kV, such as the proposed Laurel-to-Bridger project, fall under the Act. The Act stipulates that construction cannot begin until the Board certifies public need for and environmental compatibility of proposed facilities.

The Act requires the Board to determine whether a proposed project is needed and is properly designed and located to cause no more than minimum adverse impacts, considering the state of available technology and the nature and economics of the alternatives. DNRC evaluates potential projects to determine whether these requirements are met, and prepares recommendations for the Board. These recommendations are included along with DNRC's analyses in the environmental impact statement. DNRC has until August, 1985, to make its recommendation to the Board on the Laurel-Bridger project. The Board then appoints a hearing examiner and begins its hearing process, which provides a record that the Board will use in making a decision. This process is expected to begin during the fall and possibly continue into the winter of 1985. DNRC will give notice of the dates for the Board proceedings to persons participating in the EIS process as those dates are set.

The Board hears testimony and uses the hearing record to determine the following: (1) the basis of need for the facility; (2) the nature of the probable environmental impact; (3) whether the facility represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives; (4) whether the facility meets the applicable criteria set forth in section 75-20-503, MCA; (5) what part, if any, of the line should be located underground; (6) whether the facility is consistent with regional plans for expansion of the interconnected grid; (7) whether the facility will serve the interests of the utility system economy and reliability; (8) whether the facility could be built at a specific location to conform to applicable state and local laws; (9) whether the facility will serve the public interest, convenience, and necessity; (10) that the Montana Department of Health and Environmental Sciences has issued any permits required within its jurisdiction; and (11) that the use of public lands for location of the facility was evaluated and public lands were selected whenever their use is as economically practical as the use of private lands and compatible with the environmental criteria in the Siting Act.

After the hearing, the Board will either approve or disapprove the project. If the Board approves, it will describe what conditions, if any, should be attached to the Certificate of Environmental Compatibility and Public Need.

The Board also must approve the final location for the transmission line. This process is called "centerline study," and would occur after the Board selects a route for the project.

Requirements of the Board and Department of Health and Environmental Sciences

Within one year after it accepts an application, DHES is required to issue a decision as to whether the proposed project would comply with all applicable laws it administers. It must be determined whether the primary and reasonable ultimate locations for the proposed facility could comply with all permit requirements and standards under DHES's jurisdiction.

DNRC Approach to EIS Preparation

DNRC encourages interested persons to provide relevant information and comments on the proposed project. Public meetings to define the scope of issues and individual contacts during field work are used to gather information, which is evaluated along with information supplied in the application and compiled into an EIS. After the draft EIS is issued to the public, DNRC holds an additional public meeting to receive oral or written statements. DNRC evaluates the comments on the draft EIS to determine what issues, if any, remain to be dealt with. The "final" EIS contains responses to these comments, information or issues raised since publication of the draft, and DNRC's final recommendations to the Board.

Participation by Governmental Agencies and the Public

DNRC asked other state agencies what potential impacts the proposed project would have on the resources each agency is responsible for. In the case of the proposed project, DNRC has obtained information from the Department of Fish, Wildlife and Parks and the State Historic Preservation Office. Other state agencies asked to comment on this EIS include: Department of Highways, Department of Agriculture, Department of Administration, Department of Commerce, Department of Revenue, and Public Service Commission.

Federal agencies and local officials in the project area have received copies of MPC's application and will receive copies of the draft EIS. These materials also have been filed with libraries in the project area. A permit to cross the designated floodplain of the Yellowstone River and Clarks Fork will be required from the Yellowstone County Disaster and Emergency Services office in Billings. DNRC also met with the Carbon County Commission and county planners.

DNRC held a public meeting in Fromberg on December 13, 1984, to present information on the project and receive comments from landowners and interested persons. Sixteen persons attended the meeting. Issues discussed included: whether the line is needed; potential health or safety hazards to persons and livestock near the line; land-use impacts and potential for weed problems along the transmission line; and the effect of access roads. DNRC used the information received to help decide which issues should be discussed in this draft EIS. There were no suggestions that the line should follow a route different than those evaluated by MPC.

Another source of public opinion was a survey of area residents MPC conducted in January and February of 1983. In preparing its application to DNRC, MPC surveyed 200 households within the study area. Respondents identified areas they believed to be incompatible with transmission lines, including residential areas, irrigated land, and recreation sites. A clear majority favored a location next to existing lines.

CHAPTER TWO

APPLICANT'S PROPOSED ACTION

INTRODUCTION

MPC has applied for a permit to build a 100-kV transmission line from a proposed substation near Bridger to a substation on the outskirts of Laurel. The purpose of the line is to reinforce the power supply to the area served by the 50-kV loop by providing an additional tie into MPC's 100-kV system at Laurel. At present, an outage in the Laurel-Bridger-Red Lodge-Columbus system can drop voltages below acceptable levels for some customers. This condition is likely to get worse because of expected population growth in the area. Carbon County experienced 14 percent population growth between 1970 and 1980.

Normally, power can be fed into the Red Lodge end of the system from the generators at Mystic Lake Dam, but occasional long-term outages at the dam (including one lasting 9 months in 1977-78) have led MPC to conclude that an additional line is needed to provide adequate service if there should be an outage in the system while the Mystic Lake generators are not operable.

DESCRIPTION OF THE PROPOSED PROJECT

MPC's preferred route for the new line would place it along the existing Laurel-Bridger "A" line (built by MPC in 1975) for its entire length. The new line would use the same size poles and conductors as the "A" line and the two lines would be virtually identical. This route is approximately 27 miles long. From the substation site about 2 miles northeast of Bridger, it follows the "A" line along the ridge tops and highlands on the east side of the valley, to the substation on the east side of Laurel (Figure 1). It crosses the Clarks Fork about 1.75 miles southeast of Laurel and the Yellowstone about 0.75 mile southeast of Laurel.

MPC's preferred route would cross 1.1 miles of dry cropland and 0.2 miles of irrigated cropland. The remainder of the land crossed is rangeland. The route generally parallels the Clarks Fork at a distance of 1 to 3 miles. The highways south from Laurel are on the west side of the river, still farther from the proposed line.

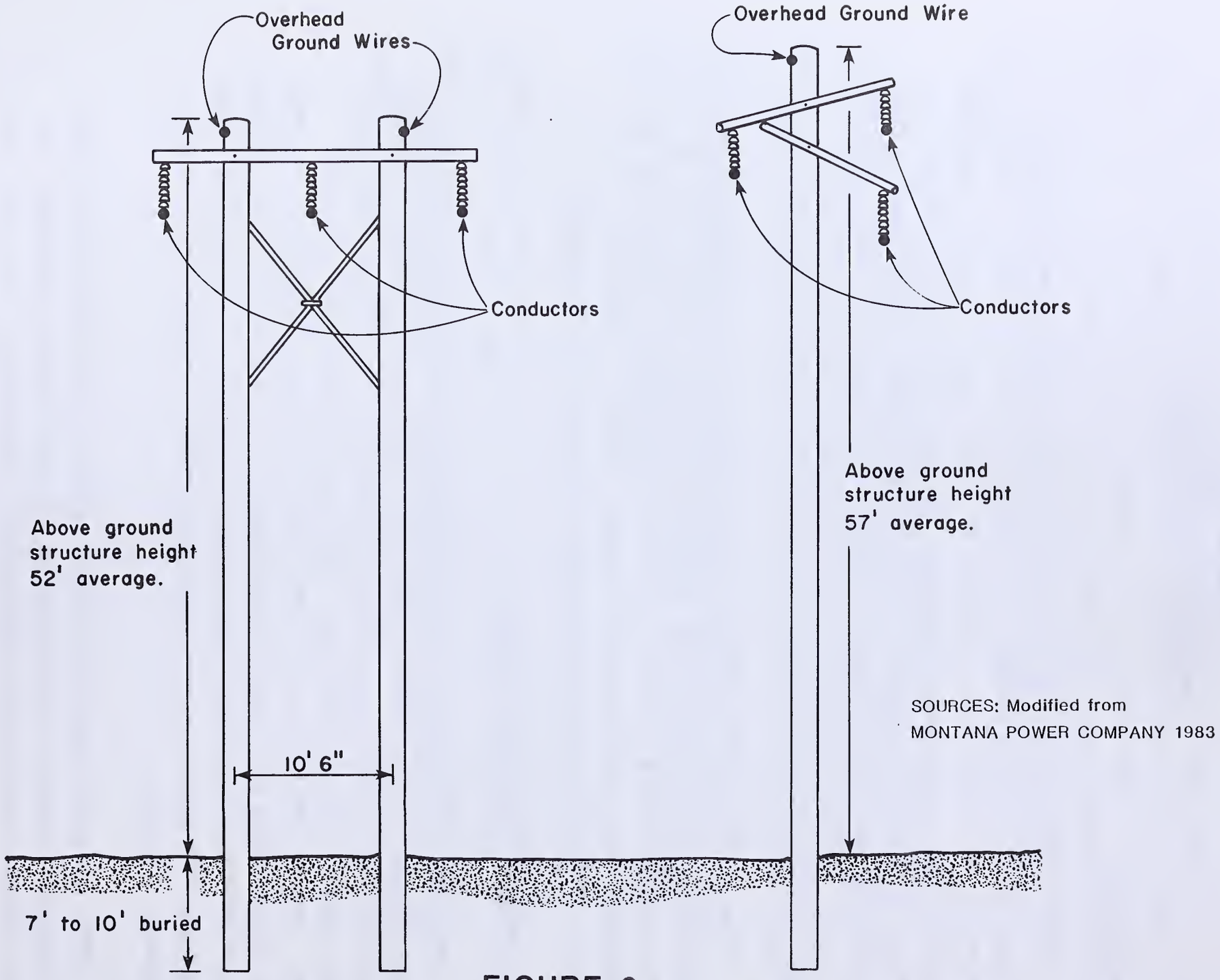


FIGURE 2

STRUCTURES PROPOSED FOR THE LAUREL-BRIDGER PROJECT

There would be little need for new access roads along this route because the line would be close to the existing line, and the existing access roads could be used.

The line would use wood pole structures. H-frame wood pole structures would be used across grazing land, and single wood poles would be used when crossing cultivated land or other areas where larger structures would interfere with land use (Figure 2). Most of the poles would be 60 feet long, 8 feet of which would be set in the ground. Where the terrain requires, the poles may be somewhat shorter or longer. H-frame structures would be placed approximately 800 feet apart, equivalent to 6.6 spans per mile. Single poles, in sections of line that require them, would be placed 450 feet apart or 11.7 spans per mile. Guy wires and three-pole structures normally would be required wherever the line turns a corner.

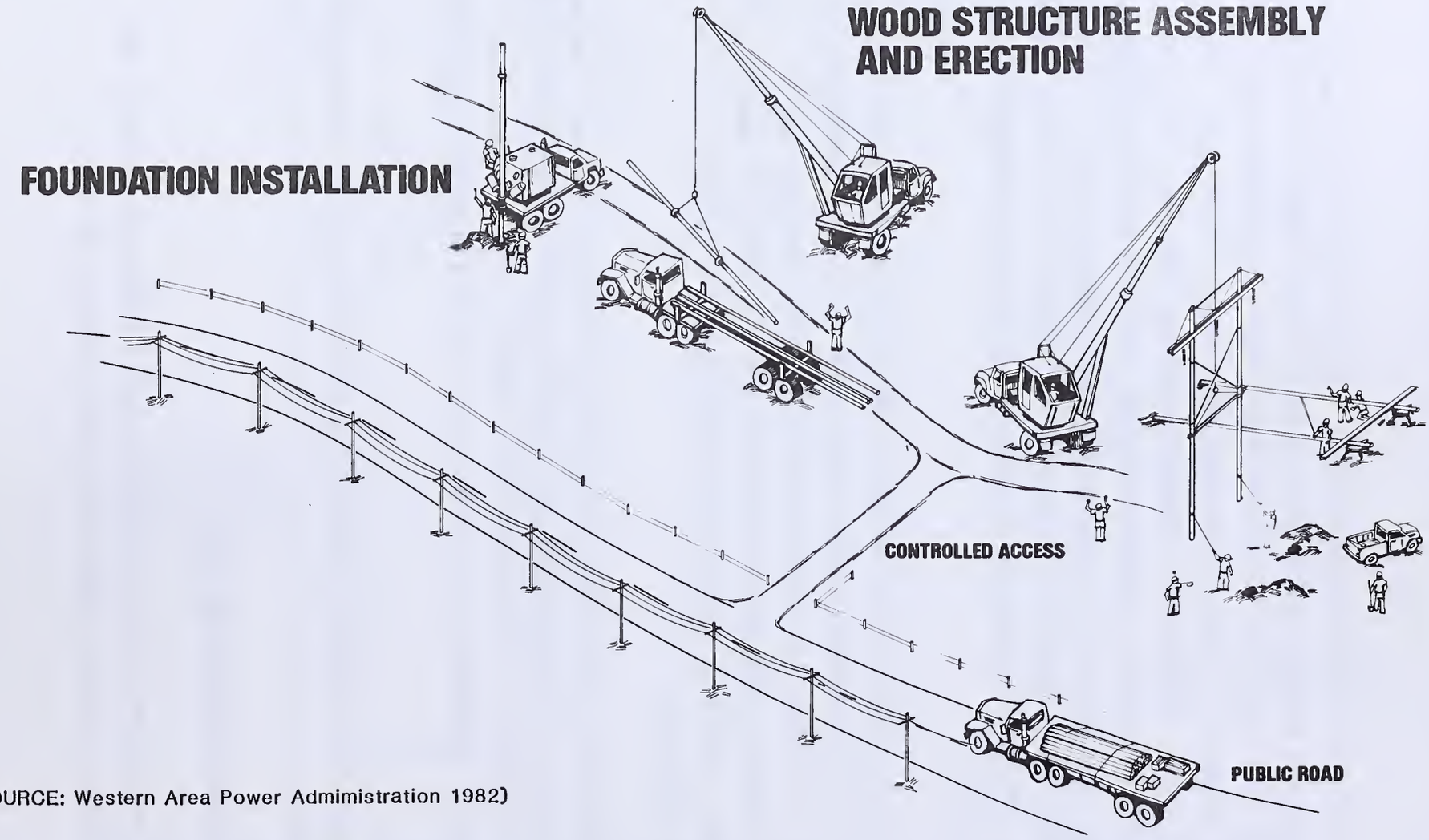
The transmission line will be built to comply with the National Electric Safety Code. This code requires that under normal operating conditions the conductors not be allowed to sag closer than 27.5 feet from the ground. Trees normally are cleared to the edge of the right-of-way. The line would require three conductors. Overhead ground wires would be used to protect the line from lightning (see Figure 2).

The substation that would form the southern terminus of the new line has not yet been built. It is scheduled to be built in 1986 in conjunction with upgrading the existing "A" line from 50-kV to 100-kV. The new line would require additional equipment at the Laurel auto substation and the new Bridger substation.

It is estimated the proposed project would cost $2.2 million (dollars at their 1985 value).

Land Acquisition and Right-of-Way Use

MPC's standard right-of-way width for 100-kV H-frame structures is 60 feet. Right-of-way width for single wood poles would be 40 feet.



(SOURCE: Western Area Power Admimistration 1982)

FIGURE 3

TYPICAL CONSTRUCTION ACTIVITIES

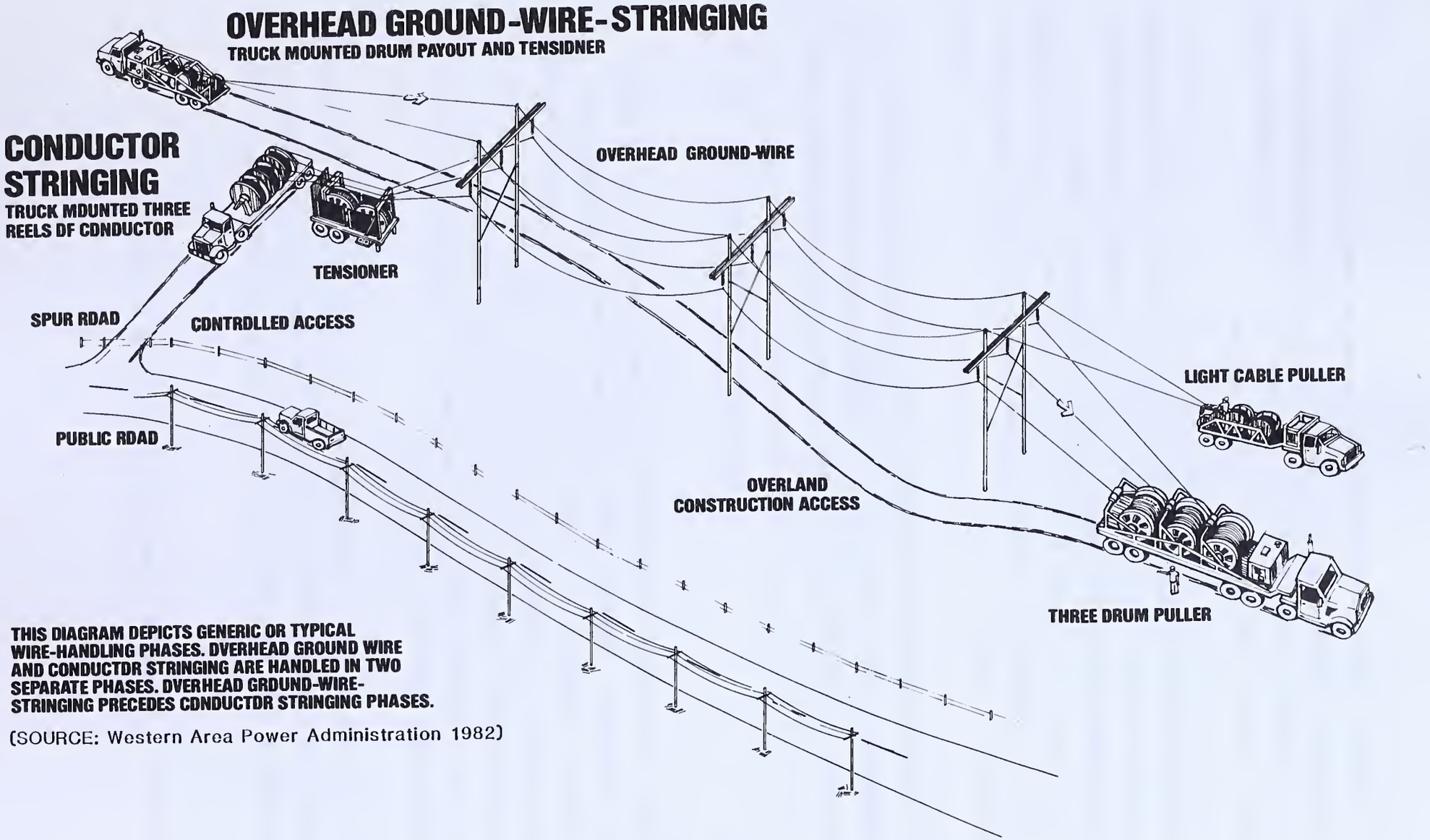


FIGURE 4

BASIC WIRE-HANDLING EQUIPMENT

MPC would obtain a right-of-way easement for maintenance and operation of the transmission line. Ownership of the land within the right-of-way would remain with the landowner, and any use of the land that did not interfere with rights acquired by MPC in the easement could continue.

Cultivation and most other agricultural activities could still be carried on in the right-of-way after construction. Sprinkler irrigation could become more difficult, however, and there would be the potential for some inconvenience if poles are located in the fields. MPC said it would avoid such problems as much as possible by following fence lines and natural boundaries to keep structures out of fields.

MPC normally would acquire land through easement negotiations with individual landowners. MPC has the right of eminent domain, which allows it to condemn property for a right-of-way if normal easement negotiations are not successful.

Construction

Construction of the 100-kV transmission line would require use of both heavy and light equipment. Construction operations normally required for transmission lines of this size are shown in Figures 3 and 4. Actual equipment used may differ slightly, depending on the contractor. The amount of road construction would depend on several factors, including existing access, terrain, slope, and equipment used by the contractor. MPC does not plan to construct any permanent roads for the project.

Construction of the new line is expected to take about 9 weeks. An average of 20 workers would be required for the transmission line, with as many as 35 at peak. Four workers will be needed for about 9 weeks to modify each of the substations.

Construction is not expected to begin before spring of 1986.

Operation

Operation of the proposed project would not require any permanent employees.

Electrical noise at the edge of the right-of-way is expected to be 25 decibels, which would be barely discernible. Electrical fields associated with the line would be well below the state's 1kV per meter standard 0.5kV per meter (kV/m) at the edge of the proposed 60-foot right-of-way, and would not be noticeable.

Maintenance

Maintenance work on the substation would involve routine checks and service to correct any problems with components. There would be routine checks of the transmission line twice yearly. This would be accomplished the first year with one vehicle driving along the right-of-way. Helicopters and fixed-wing aircraft would be used after the first year.

CHAPTER THREE

ECONOMIC ANALYSIS OF THE PROPOSED PROJECT AND ITS ALTERNATIVES

DESCRIPTION OF THE EXISTING TRANSMISSION SYSTEM

The Laurel-Red Lodge-Absarokee-Columbus area is served by a loop of the MPC 50-kV transmission system (see Figure 5). This loop consists of a single 50-kV line from the Laurel city substation to Columbus to Mystic Lake to Red Lodge, and two 50-kV lines from the Laurel auto substation to Bridger and from Bridger to Red Lodge. One of the Laurel to Bridger lines (the "A" line) is built to 100-kV specifications and is planned to be energized at 100-kV when the Bridger substation is completed in 1986.

Power for this area comes from the Mystic Lake Dam hydroelectric plant west of Red Lodge and the 100-kV system at Laurel. A 50-kV line connects the 50-kV loop to Big Timber. This line supplies customers between Big Timber and Columbus, and normally draws a small amount of power from the loop.

EXPLANATION OF NEED FOR THE FACILITY

Explanation of the Problem

The Laurel-Red Lodge-Absarokee-Columbus area presents a difficult electrical problem. When Mystic Lake Dam is in service, adequate voltage can be maintained at all substations in the loop, even if one major line is out of service. However, if the Mystic Lake plant is out of service, all power must come over the lines from Laurel. The 50-kV lines serving the area were mostly built in the 1920s of relatively small gauge wire and are, therefore, limited in their power transfer capacity. If one of these lines goes out while Mystic Lake Dam is inoperable, it causes unacceptably low voltages on much of the area's transmission system.

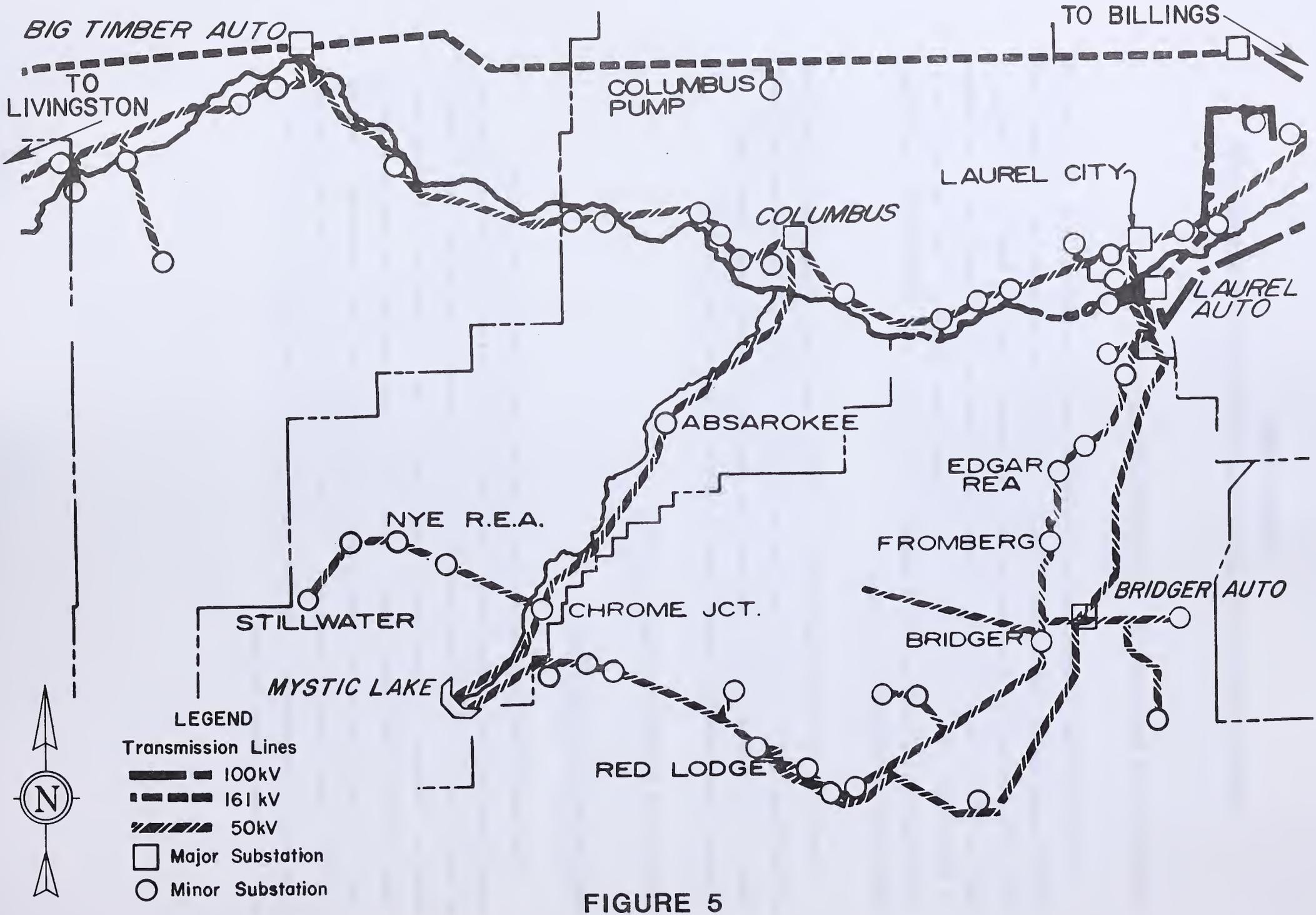


FIGURE 5

EXISTING TRANSMISSION SYSTEM IN THE PROJECT VICINITY

In 1973, MPC received permission to build the Laurel-to-Bridger "A" line and an associated substation at Bridger. This line was built to 100-kV specifications but has been operated only at 50-kV. Construction of the planned Bridger automatic substation will allow this line to be upgraded to 100-kV operation. This upgrading will strengthen the electrical supply system in the Laurel-Red Lodge-Absarokee-Columbus areas by providing additional power transfer capacity between Laurel and Bridger. However, even after this upgrading, some service problems still would occur on the system when Mystic Lake Dam is out of service and there is an outage on any major transmission line serving the area. As loads grow in the area, these problems are expected to get worse.

In the long run, the limited capacity of the 50-kV system may make it necessary to reinforce both the Laurel-Bridger-Red Lodge and the Columbus-Mystic Lake-Red Lodge sides of the 50-kV loop to maintain reliability and adequate service. The situation is complicated by uncertainty as to when a proposed chromium mine will open at Stillwater, and what its electrical requirements will be. If it requires substantially more power than is available through the 50-kV loop, then the western side of the loop will require additional reinforcement. MPC tried to find a single project that would solve the reliability problem and also serve the potential needs of the mine, but was not successful.

Applicant's Explanation of Need

MPC's reliability criterion for transmission systems requires that voltages be kept between 90 percent and 105 percent of normal at all substations, even with an outage on the transmission system. Voltages outside this range can damage appliances and electrical equipment. Because the Mystic Lake generating facilities may be subject to occasional prolonged outages, MPC requires that voltages be maintained at acceptable levels even when Mystic Dam is out of service and any main transmission line fails. Studies performed by MPC and reviewed by DNRC indicate that with the Laurel-to-Bridger "A" line operating at 100-kV and with Mystic Lake Dam in service, the transmission system could maintain acceptable voltages at all substations during the failure of any

single transmission line. However, when Mystic Lake Dam is not in service, there are several different outage situations that would drop voltages unacceptably low during winter peak loads. These problems could be avoided by construction of the proposed line to maintain voltages sufficient to meet MPC's reliability criterion.

DNRC's Economic Analysis of Need for the Line

The Siting Act requires the Board to determine the basis of need for a facility (MCA 75-20-301). The Board's rules implementing this section of the Act require that there be "a reasonable assurance that the expected benefits of the proposed facility exceed the costs of the facility" (ARM 36.7.3506 (6)) and "that the value of the savings from reduced outage plus any value for general reliability of service, over the life of the facility, is reasonably likely to exceed the cost of the proposed facility" (ARM 36.7.3506(7)).

Unreliable electric service imposes costs on customers. These costs could be reduced by building the proposed line to increase reliability. Power failures inconvenience customers and can cause various types of damage, such as frozen plumbing, spoilage of frozen and refrigerated food, and disruption of business.

In evaluating the need for the proposed transmission line, DNRC estimated the value of reliability . The next section outlines the procedures that were followed and the resulting estimates of benefits from building the line. (More detail can be found in DNRC's technical report on this subject.)

EVALUATION OF THE BENEFITS OF IMPROVED RELIABILITY

To determine a value for the line's benefits, DNRC estimated the average frequency of outages that would result if the proposed line were not built and the costs to customers that would be avoided by preventing these outages.

The Frequency of Outages

Customers served by the 50-kV loop lose electric service when Mystic Lake Dam is operating below full capacity and there is an outage in the transmission system. MPC provided DNRC with a list of transmission line outages that occurred in the area from 1977 through 1984. DNRC divided these into three categories. Minor outages were defined as loss of service by customers in Absarokee and the rural areas served by the 50-kV system between Mystic Lake and Columbus. Major outages were defined as loss of service by customers in Red Lodge, Bridger, and other areas served by the system between Mystic Lake and Laurel. Worst case outages were defined as loss of service by all customers in the area outside of Laurel.

MPC data indicate that the Mystic Lake power plant can go partially or completely out of service because of problems with one or both of the generators or with the pipeline that carries water from the dam to the powerhouse. Also, the generators must periodically be taken out of service for routine maintenance. Most unscheduled outages have been relatively brief and have usually affected only one of the generators at a time. The pipeline has periodic minor problems which are readily corrected, and also has had at least one major failure. In this incident, which occurred in May of 1977, a fallen rock broke the pipe carrying water to the generators and the escaping water washed out the hillside supporting a section of the pipeline. The power plant was not returned to operation until February of the next year.

The likelihood of a similar occurrence in the future is difficult to evaluate. MPC plans to replace the existing wood pipeline with steel pipe in 1985 and 1986. Additional measures are planned to decrease the pipeline's vulnerability to failures from rock falls. However, it is not possible to say that the possibility of major unscheduled generation outage at Mystic Lake will be completely eliminated by the new pipeline. DNRC therefore used a range of probabilities in calculating the likelihood that a major pipeline failure would render Mystic Lake Dam inoperable.

Table 1 provides DNRC's estimate of the total length of time each year that customers served by the 50-kV loop will be out of power and how severe those outages would be without the proposed line.

TABLE 1
PREDICTED CUMULATIVE OUTAGE TIME FOR EACH WINTER PERIOD
(Based on MPC data on Past Outages)

Outage Severity	Time Estimates (hours) High	Most Likely	Low
Minor[1]	6.14	4.65	3.07
Major[2]	10.69	6.84	3.07
Worst Case[3]	1.23	0.79	0.35

* Winter period was based on outages during months of November through March.

[1] Minor outages are defined as those that would affect customers in Absarokee and rural areas between Mystic Lake and Columbus.
[2] Major outages are those that would affect customers in Red Lodge, Bridger, and rural areas between Mystic Lake and Laurel, or a similar number of other customers in the study area.
[3] Worst case outages are those that would affect all customers on 50-kV loop outside of Laurel.

The Costs of Outages

DNRC estimated the average annual outage costs for each of the categories shown in Table 2. Various costs to consumers from electrical outages include: (1) lost residential electric service; (2) damages incurred by residential customers, primarily from frozen pipes; (3) lost or delayed retail sales; (4) damages incurred by commercial customers, primarily from spoiled food; (5) lost, delayed, or damaged industrial production; and (6) the cost of operating backup generators to provide vital public services. These estimates were based on MPC data regarding the number of residential, commercial, and industrial customers in the area and their demand for electricity, census data pertaining to retail sales and inventories, interviews with plumbing contractors on the costs of frozen pipes, interviews with local governments and the two hospitals serving the area, and other published data.

In addition to the average costs of outages, unreliable electric service imposes costs because of the unpredictability of outages and the year-to-year variation in the actual number, length, and timing of outages. DNRC estimated the cost to consumers of this uncertainty using a standard technique developed to estimate the premiums people would pay to insure against various risks. DNRC's estimate of this cost is also shown in Table 2.

A detailed explanation of the techniques used to estimate the costs of outages and uncertainty can be found in DNRC's technical paper on this subject.

Benefits of the Line

The value of the benefits of the proposed transmission line in any year is the sum of the reduction in the costs of outages and uncertainty. DNRC's estimate of the value of these benefits in the line's first year of operation is shown in Table 2. DNRC's analysis indicates the value of the first year's benefits range from $35,800 to $223,000, with a "most likely" estimate of $92,800.

TABLE 2
AVERAGE ANNUAL BENEFITS OF THE PROPOSED TRANSMISSION LINE
(dollars at their 1980 value)

Reduced Outage Costs	Low Estimate	Most Likely	High Estimate
Costs to Consumers of Outages			
Lost residential consumption	$12,200	$40,200	$141,800
Residential damage	$12,000	$26,900	$ 41,800
Delayed retail sales	**	**	**
Commercial damages	$ 5,000	$10,900	$ 16,800
Industrial losses	$ 6,200	$13,800	$ 21,300
Backup generation	$ 100	$ 300	$ 400
Reduced uncertainty	$ 300	$ 700	$ 900
TOTAL	$35,800	$92,800	$223,000

** values were calculated to be insignificant

Annual benefits were assumed to grow in proportion with load growth in the area served by the line. Total lifetime benefits of the line were then calculated by discounting future values of benefits back to the present. DNRC's estimates of these benefits ranged from less than $1 million to a high of more than $20 million. This broad range can be further narrowed since many of these values have low probability of occurring. DNRC's analysis shows that the lowest likely value would be $2.6 million, while the highest likely value is expected to be $8.5 million. Within this range, DNRC estimates that the line is most likely to give present value of benefits of $5.3 million (in dollars at their 1985 value).

Conclusion

MPC estimated the cost of the proposed project as $2.2 million (in dollars at their 1985 value). Given these costs and the estimate of benefits above, DNRC concludes that there is a reasonable assurance that the benefits of the proposed project are greater than its costs. Thus, the proposed project meets the state's criterion of need.

ALTERNATIVES

The Board must determine that a proposed facility represents the minimum adverse environmental impact, considering the state of available technology and nature and economics of the various alternatives. The following alternatives were evaluated by MPC and DNRC but rejected as inadequate to meet MPC's requirements at a reasonable cost.

Transmission Alternatives

MPC considered several alternatives to the proposed project and rejected all of them, either as costing substantially more than MPC's preferred alternative or as not solving the reliability problem. The possibilities considered included upgrading the 50-kV system to 69-kV; running a 100-kV line from Laurel to Chrome Junction; extending the 100-kV line from Bridger to Chrome Junction; and connecting the 50-kV loop to the 161-kV system by a 161-kV line from either Columbus Pump or Big Timber to either Nye or Chrome Junction (see Figure 5).

Ugrading the 50-kV loop to 69-kV was rejected because it did not solve the reliability problem. Service still could not be guaranteed to all customers in the event of outages at Mystic Lake Dam and on one transmission line. Extending the 100-kV line from Bridger to Chrome Junction and running a 100-kV line from Laurel to Chrome Junction are both more expensive than MPC's preferred alternative and had no significant environmental advantages, so they were rejected. The 161-kV lines to Nye were rejected because they did not

solve the reliability problem. Running a 161-kV line to Chrome Junction would at best marginally solve the reliability problem and would be more expensive than MPC's preferred alternative with no significant environmental advantages so it was rejected.

Another possible alternative DNRC considered was running a 100-kV line from Laurel to Absarokee. This was rejected because it did not solve the problem of low voltage in the Red Lodge area during certain outage conditions.

Nontransmission Alternatives

MPC evaluated and rejected new permanent generation facilities, conservation, and load management techniques as alternatives to the proposed transmission line. DNRC reviewed MPC's evaluations and concurs with its findings.

MPC identified and evaluated four generation alternatives. They were wind turbine generation, solar generation, a combustion turbine generator, and additional hydroelectric generation.

The high cost and intermittent and uncertain nature of wind-powered and solar generation make them unsuitable for increasing reliability. The permanent installation of combustion turbines was rejected because it would cost an estimated eight times as much as MPC's preferred alternative. DNRC evaluated temporary generation facilities as a possible alternative to construction of the proposed project. Portable diesel-powered generators of up to 10 MW are available for rent on notice as short as one week. DNRC examined three scenarios for the use of such generators, but found that none of these options would be as cost-effective as the proposed project.

Two possible hydroelectric sites in the area were considered. One is 18 miles northeast of Bridger on Rock Creek, with a potential generating capacity of 1.2 MW. The other is 26 miles west of Laurel on the Stillwater River and has a potential generating capacity of 4.3 MW. These options offer generation capacity too small to cover the loss of the Mystic Lake powerplant. An additional problem is that the Stillwater site is too far from the Red Lodge area where the main reliability problem occurs.

Conservation also was examined as an alternative. The technically feasible conservation potential in the Laurel-Red Lodge-Absarokee-Columbus area is not enough to solve the reliability problem.

A final alternative examined was the use of load management techniques. Load management programs, which are designed to reduce peak loads by inducing customers to shift electricity use to off-peak hours, are most successful in urban areas with high load density. The Laurel-Red Lodge-Absarokee-Columbus area is mostly rural with a low load density. MPC therefore rejected load management as not having the potential to reduce loads enough to guarantee reliability of service, and DNRC agrees.

Conclusion

None of the alternatives examined would be better than MPC's proposed transmission line for providing the necessary reliability. Further, DNRC's economic evaluation indicates that the proposed project has greater potential net benefits than any of the alternatives examined.

CHAPTER FOUR

SOCIAL, ECONOMIC AND ENVIRONMENTAL CONCERNS

EXISTING ENVIRONMENT

The study area for the proposed Laurel-Bridger project (Figure 1) encompasses approximately 165 square miles, corresponding roughly to the valley of the Clarks Fork of the Yellowstone River between Laurel and Bridger.

This portion of the Clarks Fork valley is approximately 1 to 2.5 miles wide. The valley is well defined in most areas, with a sharp break in slope where the upland begins. The upland area generally has moderate slopes. However, many small streams, both year-round and intermittent, have cut portions of the uplands, resulting in some areas of steep and broken terrain.

Southeast of Laurel the Clarks Fork enters the Yellowstone from the south. Near Laurel the designated 100-year floodplain of the Yellowstone River and the Clarks Fork is about 1.4 miles wide. Near Bridger the Clarks Fork floodplain is only 0.2 miles wide.

There are landslide areas along hillsides north of Fivemile Creek, which appear to have been active within the last 10 years. Several other landslide areas were noted adjacent to Cottonwood Creek within 200 feet of where the existing transmission line crosses it.

Marshes and other wet areas are scattered along the Clarks Fork valley in old channels formerly occupied by the river and in low-lying areas adjacent to the railroad and Highway 310. Saline seeps are associated with the shale-based soils in the study area, and the soil in these seeps may remain wet longer than adjacent nonsaline soils. Soil Conservation Service maps show scattered areas of saline soils (USDA 1972, 1975). Saline seeps were noted just west of the proposed Bridger substation site and south of Edgar.

Annual precipitation in the study area ranges from 10 inches to 14 inches with much of it falling in the spring. High spring precipitation coupled with spring runoff sometimes causes flooding along streams and rivers in the area.

Human settlement, irrigated cropland, and transportation corridors are concentrated along the floor of the valley. The main roads in the study area are U.S. Highway 310, which parallels the Clarks Fork and connects the communities of Rockvale, Fromberg, and Bridger, and U.S. 212, which provides the main link from Laurel through Silesia and Rockvale, to Red Lodge and Yellowstone National Park. The Burlington Northern Railroad also lies immediately adjacent to the Clarks Fork between Laurel and Bridger.

Agriculture is important in the study area. The valley is one of the most productive agricultural areas of Montana because of its rich alluvial soils, a relatively long growing season, and intensive irrigation. Most of the irrigated cropland in the study area is located along the valley floor. A large system of irrigation canals is present there. Crops grown include barley, silage corn, sugar beets, and beans (MPC 1984). Alfalfa is usually planted in a three-year rotation with these crops.

There is some dry cropland on the uplands above the valley floor. There are two center-pivot irrigation systems on the uplands. Crops include winter wheat, hay, and barley. A significant amount of dry cropland has not been cultivated in recent years and is returning to rangeland, supporting grasses and forbs. Extensive rangeland surrounds the areas of dry cropland and supports an average of 1 to 6 animal unit months per acre of forage production (USDA 1985).

The bottomland along the Clarks Fork supports shrubs, grasses, and cottonwoods, and provides important wildlife habitat and livestock forage. Tree roots in these areas contribute to streambank stability.

Bridger (population 715) and Fromberg (population 458) are the two incorporated communities in the study area. Laurel (population 5,481) is just outside the north end of the study area. Unincorporated townsites in the study area include Silesia, Rockvale, and Edgar, each with a population less than 100.

Houses are concentrated on the south side of Laurel along Highway 212 and between Silesia and Rockvale. Homes also are scattered around Edgar, Fromberg, and Bridger. Subdivisions in the north end of the Clarks Fork valley have developed as a result of economic growth in the Billings metropolitan area. The scenic qualitites of the area are one influence on the expanding residential development.

The Clarks Fork valley provides expansive views, extending up and down the drainage and out to the bordering foothills. Trees restrict the view along the river bottom, but from the foothills, views are largely unrestricted and extend across the valley and ridges to the distant Beartooth Mountains.

Recreation facilities in the study area include the Edgar Firemen's Park, Fromberg Community Park, a rest area 2 miles north of Bridger adjacent to Highway 310, Lion's Club Park and city parks in Bridger, and Riverside Park on the south side of the Yellowstone River near Laurel. The Rock Creek campground near Rockvale is privately owned and operated. The Yellowstone and Clarks Fork rivers provide opportunities for dispersed recreation such as waterfowl hunting and fishing.

Small cities and towns provide essential goods and services to residents and businesses in the study area. Tourism also contributes to the economies of communities in the study area, with many tourists traveling from Laurel to Yellowstone National Park. Businesses benefiting from traveler expenditures include small grocery and convenience stores, service stations, bars, restaurants, and motels.

The alternate routes and substation locations considered for the transmission line lie within the taxing jurisdictions of two counties, one incorporated town, three public high school districts, and four elementary school districts. Recent changes in state tax laws reducing taxable valuations of agricultural and business property have contributed to actual net losses in taxable values of some of these taxing jurisdictions (see Appendix A).

The study area contains formations of fossil-bearing rock in the uplands and alluvial soils in the valleys. Rock outcrops in the area can be expected to yield marine invertebrate fossils such as mollusks. Certain geologic deposits, such as those in the Judith River Formation, have contributed abundant dinosaur and small mammal vertebrate fossils in other parts of the state. Parts of this formation are present in the study area west of Fromberg. Other geologic formations have potential for yielding reptile and fish fossils of moderate importance. Alluvial soils in the Clarks Fork and Yellowstone River valleys have low potential for containing important vertebrate fossils.

Although there are no known paleontological sites in the study area, there is a low-to-moderate potential for discovery of vertebrate fossils. A major dinosaur fossil site is located outside the study area 7 miles southeast of Bridger. Vertebrate fossil types which could be found include mammoth, horse, bison, and other mammals, dinosaurs, and other reptiles and fish. Discovery of vertebrate fossils is usually an isolated and rare occurrence, but such sites, if found, would likely be of moderate to high significance.

No archaeological sites are known in the study area, although a wide variety of prehistoric activity is believed to have been carried on there. The valley probably was a travel route to and from the Pryor and Absarokee mountains. The Clarks Fork and other tributaries of the Yellowstone served as wintering places for the Crow and other plains people. Archaeological sites that could exist in the area include campsites, bison kills or stone quarries, rock cairns, pictographs, petroglyphs, and burials.

The history of the study area is represented in 80 known historical sites, including trails, historic communities, homesteads, farms, ranches, bridges, coal mines, and associated mine structures.

The portion of the Yellowstone River in the study area is considered a transition zone between a warm-water and cold-water fishery. The river is classified as a "high-priority" fishery (Class II) above the Laurel bridge and "substantial" fishery (Class III) below (DFWP 1980). The reach within the study area receives moderate fishing pressure and produces primarily brown trout, rainbow trout, and ling (Fredenberg 1985).

The Montana Department of Fish, Wildlife and Parks (DFWP) classifies the Clarks Fork from Bridger to Laurel as a "moderate" (Class IV) fishery (DFWP 1980). Fishery quality is limited by high sediment loads (DNRC 1973a), and although the river supports some brown trout, rainbow trout, and mountain whitefish, it is considered a low quality, low use fishery (Fredenberg 1985). Major tributaries to the Clarks Fork include Bluewater Creek and Rock Creek.

According to information obtained from DFWP, the tributaries to the Clark Fork do not support significant sport fisheries within the study area (Fredenberg 1985). No stream segment in the study area is believed to harbor threatened or endangered fish species or fish designated by DFWP as species of special interest or concern.

There is a variety of wild plant and animal species in the study area, but no threatened or endangered species would be endangered by the project. Wildlife habitat that might be affected by the project includes stands of mature cottonwood forest along the Clarks Fork and Yellowstone. The study area does not include any significant amount of high-security summer-fall habitat for big game species. Although the study area receives a moderate amount of use by wintering mule and white-tailed deer, no major winter concentration areas are known (Eustace 1985).

Hawks, owls, and eagles use the study area at different times of the year. Peregrine falcons, an endangered species, occasionally migrate through the area, but are not known to nest there (Brewster 1982). Bald eagles are an endangered species, and they winter along rivers in small numbers, though no regularly-used roosts are known in the study area (Brewster 1982). Bald eagle nests were located within the study area in 1971 and 1976 (Flath 1984), but none is known to be in use in the vicinity at present. No other birds of prey nests are known in the study area, although some could be discovered during future study. No known grouse dancing grounds or great blue heron rookeries exist in the study area (Eustace 1985).

POTENTIAL IMPACTS OF THE PROPOSED PROJECT

Residential Concerns

Construction-related impacts to residents, such as noise, dust, and vehicular traffic, are not likely to be significant due to the small work force and short construction period.

Noise and Safety Concerns

Transmission lines produce an electric field which can induce a current in ungrounded fences, metal structures, and vehicles close to the line. Fences and metal buildings crossed by the right-of-way will be grounded as part of MPC's line construction procedures. Grounding of these structures will prevent shocks to persons or animals coming in contact with them. The current induced by the line's electric field in the largest vehicle likely to be parked near it is 0.44 milliamps, which is less than the 1.1 milliamp level which is the lowest that can be felt by the average man as reported by the Electric Power Research Institute (EPRI 1975). This means that the shock hazard from vehicles parked near the line is insignificant. The field associated with this line would be too weak to be felt by most people, with field strength of 0.5 kV/m at the edge of the 60-foot right-of-way. This value is less than the 1.0 kV/m maximum limit adopted by the State of Montana (ARM 36.7.3507(2)(d)) and less than the human median level of electric field perception of 2.7 kV/m as reported by EPRI (1975). The weak electric field of the proposed line would not pose any threat to human health, livestock, or property.

Noise generated by the proposed 100-kV line is expected to be less than 30 decibels at the edge of the 60-foot right-of-way. This is roughly equivalent to the sound inside a library (EPRI 1975) and is likely to be far less than typical background environmental noise, such as wind.

The proposed 100-kV transmission line would interfere with radio and TV signals to a minor extent, especially in rainy weather. This interference decreases rapidly as distance from the line increases, and residences located more than 600 feet from the line should not experience any noticeable effects (March 1984). Depending on the present quality of reception, some homes could be much closer to the line and still not experience degraded signals. If interference occurs, MPC can correct the problems by shielding antennae or using other mitigation devices. Measures to correct these problems are easily installed and MPC would be required to correct the problems.

Agricultural Land Use Concerns

During construction of the transmission line, cultivation would be pre-empted on the temporary roads required to reach structure sites and staging areas. Disruption of cultivated land during construction can be minimized by using existing roads along field borders.

The presence of transmission line structures on cultivated land would remove an insignificant amount of land from production. However, the necessity of maneuvering farm machinery to avoid structures in fields would increase the time and costs of cultivation. Further, the small area that could not be mechanically cultivated could require chemical treatment to control weeds or other undesirable plant species. In some fields, the presence of the structures could preclude the installation of some mechanical irrigation systems. Structures in cultivated areas also would make aerial application of chemicals more difficult and expensive.

Impacts to cultivated land can best be minimized by avoiding placement of structures on such land. When no other economical siting option is available, use of single-pole structures and location of these structures along existing fencelines or roads, as suggested by MPC, would minimize interference with cultivation.

Public use of access roads can contribute to trespass and associated problems for the landowner. Obliteration and reseeding of access roads would discourage public use. Trespass also can be reduced by installing locked gates or replacing construction gates with permanent fencing.

Rangeland impacts of the proposed line would be significantly less serious than impacts to cultivated land. Disturbance to grazing patterns and disruption of animal access to stock water during construction would be small because of the rapid pace of construction and the installation of gates and use of other measures as required in DNRC's standard environmental specifications (Appendix B). Without reclamation, soil compaction on nongraded access roads may cause a decrease in forage production on the road surface. It may be necessary in some areas to rip the road surface and reseed.

The new substation northeast of Bridger would permanently convert about 2 acres of pastureland to nonagricultural use.

Social and Economic Effects

Local expenditures by construction workers would benefit the study area economy to some extent. Most of the construction work force probably would be from Billings. Billings is within a reasonable travel distance of the project area, and construction workers could commute daily from their homes. Purchases made by commuting construction workers would generally be limited to convenience goods and services, such as food and gasoline. Secondary economic benefits resulting from construction worker expenditures would be greater in the Billings area than in the study area.

The relatively small construction work force and brief construction period, estimated to be 88 days, along with the likelihood that most workers would commute from Billings, suggests that the project's construction would have little impact on the cost and availability of public and private services in the study area. Commuter trips and movement of equipment and materials to construction sites would cause minor increases in wear and tear on area roads and bridges. No appreciable increases in demand for local school, water, sewer and solid waste, or police and fire protection services would be likely to occur.

Operation of the transmission line would have no permanent effect on employment or population and would not change the demand for study area services.

A beneficial effect of the transmission project would be the property taxes it would generate. Total tax payment and tax benefits accruing to individual taxing jurisdictions would be about the same no matter which route is chosen. Montana's statewide 6-mill-levy to fund its university system also would benefit from the project. Estimated tax benefits from the project are listed in Appendix A.

Project development is not likely to noticeably change revenues or mill levies. Greatest dollar increases in taxable valuation will accrue to Carbon County and to the Laurel school districts, though line and substation development would cause less than a 1 percent increase in their overall taxable values. Fromberg school districts stand to experience the greatest proportional increase in taxable values.

Weed Concerns

Table 3 lists noxious weeds designated in the two counties crossed by the project, Carbon and Yellowstone.

The project may create weed problems if (1) new stands of weeds, especially noxious weeds, become established on areas disturbed by the project, or (2) if construction equipment spreads weeds from infestations along the right-of-way to other areas.

TABLE 3
DESIGNATED NOXIOUS WEEDS IN THE LAUREL-BRIDGER STUDY AREA

Species	Counties where designated
Burdock (*Arctium lappa*)	Carbon
Canada thistle (*Cirsium arvense*)	Statewide
Dalmatian toadflax (*Linaria dalmatica*)	Carbon, Yellowstone
Field bindweed (*Convolvulus arvensis*)	Statewide
Leafy spurge (*Euphorbia esula*)	Statewide
Poison hemlock (*Conium maculatum*)	Yellowstone
Russian knapweed (*Centaurea repens*)	Statewide
Spotted knapweed (*Centaurea maculosa*)	Carbon, Yellowstone
Whitetop (*Cardaria draba*)	Statewide

Source: Deines 1985; McGeorge 1985

The only potential weed source county weed supervisors identified in the study area was a leafy spurge infestation along Bluewater Creek. There is a possibility that construction vehicles could spread it to uninfested areas to the north (Deines 1985; McGeorge 1985). Potential weed problems can be reduced by following DNRC's standard environmental specifications, which require washing of vehicles when leaving weedy areas (See Appendix B).

Soil and Geology Concerns

The primary effects of transmission line construction on soils are compaction and erosion. Most compaction is likely to result from the initial two or three passes of heavy equipment. The degree of compaction on initial passes depends somewhat on soil moisture, texture, and amount of root mass in soil, but passes after the first few usually cause little additional compaction (Hatchell, et al. 1970, Chancellor 1977).

Soil compaction can result in decreased water infiltration, poorer soil aeration, and can reduce nutrient uptake by crops in low fertility soil (Byrnes et al. 1981). Chancellor (1977) notes that seedling emergence and root development can be reduced by compaction.

Soil erosion can be accelerated either through removal of vegetation, which protects the soil particles from rain and wind, or by compaction, which can lead to decreased water infiltration and increased runoff. Vegetation is removed by grading of access roads and leveling areas near pole installation locations. Steep areas are more susceptible to erosion than level areas. Excavation for tower sites or roads may require grading where sideslopes are more than 4 percent. The amount of grading will depend on the location of the access roads, structures, and the equipment a contractor will use, and may not be required on level ground or gentle slope if existing roads are available. Access does not have to be completely within the transmission line right-of-way and can avoid steep valleys and sideslopes if no structure is located there. Placement of access roads on steep terrain can be avoided in many cases by following ridge tops or flat terrain. MPC says its policy is to avoid road construction whenever possible. However, until the locations of the transmission line structures and access roads are known, there is no way of knowing exactly how many roads will be graded. Reclamation measures presented in Appendix B are expected to reduce long-term (longer than 5 years) erosion.

Some soil conditions may pose constraints which must be addressed when engineering the line or formulating reclamation measures. Fine-grained soils such as silts and clays may offer poor support for transmission line structures if they are subject to frost-heave or if they swell when wet and shrink when dry, although these problems can be overcome by using a gravel backfill (MPC 1984). Rutting is likely to occur if construction takes place on fine-grained soils when they are wet. These problems can be avoided by building when soils are dry. Rutting in areas with high water tables can be avoided by building in the winter when these areas are frozen. Some problem-soil areas may be avoided by spanning. Reclamation may be difficult in areas with extensive saline seeps. If bedrock is within 8 feet of the surface, it may have to be drilled for pole placement (MPC 1984). Reclamation of shallow soil areas may be difficult, and soil loss from these areas may be more significant than from deep soils.

Construction within the 100-year floodplain designated by the Board requires that the conductors and poles not create an obstruction to flood waters. Channel movement of the Clarks Fork and Yellowstone rivers from ice jamming or other causes of channel migration may threaten poles if the line is placed too close to these rivers. A channel movement caused by flooding forced MPC to move one of the "A" line structures that was located on an island next to where the proposed line would cross. For these reasons, caution should be exercised when constructing in or across floodplains. A permit to cross these areas would be required from the Yellowstone County Disaster and Emergency Services Agency.

The study area is located in seismic risk zone 1, where (possibly) minor and moderate damage from earthquakes could occur. An MPC record search indicates earthquakes have not caused any transmission line outages in Montana in the last 50 years (MPC 1985). Risk of damage to the line from earthquake is considered very low.

Scenic Concerns

Scenic impacts are defined as a change in the scenic quality of an area causing a change in the quality of life.

The proposed facility would not stand out visually from the present developments in the study area. The proposed transmission line would be virtually identical to the Laurel-Bridger "A" line on the east side of the valley. Various other lines already in the study area include a single-pole, 50-kV transmission line on the west side of the valley and numerous distribution lines.

Use of natural wood-colored poles to blend with the existing environment would reduce the potential contrast of the new line on any of the routes. At river crossings, impacts could be reduced by strategic location of transmission line structures out of sight behind vegetation, and crossing the river at right angles.

Recreation Concerns

Recreation impacts associated with this project will be small and indirect at worst, resulting from the visual intrusion of the line on recreation settings. No displacement or direct interference with recreation activities will occur, given the proposed route location. Measures to reduce scenic impacts also would largely avoid potential visual intrusion at designated recreation sites.

All routes cross the Yellowstone and Clarks Fork at least once, and some cross more than once. These crossings could intrude on dispersed recreation such as waterfowl hunting and fishing.

Historical, Archaeological, and Paleontological Concerns

Archaeological sites could be discovered and disturbed as a result of road construction or structure excavation. An indirect impact, such as vandalism, could result from increased access to formerly inaccessible sites, but the potential for such impact is considered low. Setting is important to some types of historical and archaeological sites, and construction of the line could alter characteristics of a setting, possibly affecting the eligibility of nearby sites for listing on the National Register of Historic Places.

Potential impacts to historical and archaeological resources for this project would be primarily visual. The greatest potential for impacts of this nature would be from routes in the bottom of the Clarks Fork valley, where most of the historical sites are located. Impacts to known historical resources would be mostly avoided by use of the applicant's proposed route. The likelihood that line and access road construction would affect any paleontological resources is low. Potential impacts to these resources include destruction or loss of artifacts, fossils, or other materials from any sites discovered during construction.

Once a route is selected, potential impacts to historical and archaeological resources must be assessed for each construction site. Measures that MPC should take to protect archaeological and historical resources once a route is approved, but prior to Board approval of a centerline, include consultation with the State Historic Preservation Office (SHPO) to determine (1) the significance and potential impact of the line on known sites and on sites discovered during centerline study or construction, and (2) a treatment plan to implement mitigating measures as described in the Environmental Specifications (Appendix B).

During centerline study, any rock outcrops with potential for paleontological significance should be identified. If such outcrops are likely to be damaged, they should be examined by a trained paleontologist prior to construction and pertinent data should be collected and recorded in consultation with SHPO.

Aquatic Life and Habitats

The project is not expected to cause any serious impacts to fish. Impacts on aquatic resources would be limited to increases in sedimentation as a result of construction of the line and access roads, and possible introduction of toxic substances, such as herbicides for weed control, into nearby streams or rivers. The Clarks Fork and the lower reaches of Rock Creek already have a high sediment load (DNRC 1973b, 1975), and any additional sediment is not expected to be significant. Steps can be taken to prevent introduction of toxic substances so that the potential for impact is low.

Adoption of the standard environmental specifications will help to prevent impacts through measures designed to guide construction and reclamation activities (see Appendix B). DNRC and MPC will consult with DFWP on the appropriate method for crossing streams during the centerline study. Similarly, during the centerline location process, structures can be placed far enough from streams to minimize potential impacts.

The amount of vegetation removal required along the banks of the Clarks Fork and Yellowstone rivers is not expected to increase the temperature of those streams enough to harm aquatic life.

Wildlife and Habitats

Birds of prey are particularly vulnerable to nest disturbance and may abandon nests if repeatedly disturbed. Although no active nests of these species are known within the study area, such nests might be discovered during final location of the line, and measures would then be required to ensure that the line's impacts are kept to a minimum.

No heron colonies are known within a mile of any of the alternative routes studied for this project, and potential for impact is considered low. If any are found, nest trees should not be removed and repeated disturbance of the colonies should be avoided to prevent abandonment of the colonies.

Where transmission lines are sited near wetlands or other waterfowl concentration areas, some waterfowl are likely to be killed by colliding with the conductors, guy wires, or overhead ground wires. In the study area, a slight waterfowl collision hazard would result where the project would cross the Clarks Fork and Yellowstone. Flight intensity during migration peaks is low compared to other areas of the state (DFWP 1985), and flight paths generally are much higher than the proposed lines. The project is not expected to kill any significant number of waterfowl if the ground wire and conductors of the proposed line are strung at the same height as the ground wires and conductors of the existing line at the Yellowstone River crossing.

Extensive cottonwood habitats such as those found along the floodplains of the Yellowstone and the Clarks Fork are valuable, both for streambank stabilization and for the diverse wildlife communities they support. The U.S. Fish and Wildlife Service has asked that large trees that may be used by bald eagles as hunting perches or winter roosts not be removed (Brewster 1982). Should the route approved for the project cross stands of cottonwoods, it would be possible to reduce impacts to some extent by topping trees and removing only those portions of stems that would interfere directly with conductor clearance and by judicious line placement during centerline study.

Another potential impact of transmission line construction, disturbance of wintering animals by construction activities on winter ranges, is not expected since construction would occur during summer months. Winter range used by both deer and pronghorn could be crossed by the project. Potential impact to winter habitat from new access roads and construction sites in winter ranges can be minimized by careful location of the roads and construction sites to minimize damage to important forage vegetation.

CHAPTER FIVE
ROUTE COMPARISONS

INTRODUCTION

In its application, MPC identified its preferred route for the proposed transmission line, and several possible alternatives, as shown in Figure 1. The locations shown on Figure 1 are not precise, because the process of locating the line leaves substantial leeway for avoiding unsuitable areas such as farmsteads, landslide areas, and irrigated fields. The Board, in approving a route, also specifies the width of the route in which the project must be located. MPC has requested a route 2 miles wide, to allow flexibility in locating the line. Once the Board approves a route, DNRC, MPC, and landowners will cooperate to determine the least-impact location for the line within the route, through a process called centerline evaluation. This process includes cooperation with landowners in selecting a line location with the least impact. The Board would conduct a public hearing before making the final decision on the location of the centerline.

Table 4 summarizes impact risk potential and costs of the proposed and alternative routes. This analysis indicates that the applicant's proposed route would have the least social, economic, and environmental impact.

DESCRIPTION OF ROUTES

DNRC evaluated four routes for this project. The routes DNRC considered are shown on Figure 1 as the Applicant's Proposed Route, the Upland Route, the River Route, and the Railroad Route.

Applicant's Proposed Route

The route preferred by MPC would follow the Laurel-to-Bridger "A" line on the ridge above the valley for its entire length. The proposed project would parallel the existing line at a distance not less than 80 feet.

TABLE 4
SUMMARY OF LENGTH, COST AND ENVIRONMENTAL RESOURCE CONCERNS
FOR THE APPLICANT'S PREFERRED AND ALTERNATE ROUTES

Concern	Route			
	Applicant's	Upland	Railroad	River
Length (miles)	26.4	26.4	28.5	28.5
Construction Cost ($)				
Transmission line	1,759,400	1,759,400	1,898,300	1,892,000
Substation Equipment	430,000	430,000	430,000	430,000
Land Use Concerns				
Miles of irrigated cropland	0.2*	0.2*	0.8**	1.5**
Miles of dry cropland crossed	1.1*	1.4 [1.1]*	-0-**	4.2**
Miles of rangeland crossed	23.3*	23.4 (8.4)*	0.8	4.6
Miles of undeveloped bottomland crossed	1.3*	1.4 [1.3)*	0.5	1.8
Miles of railroad or highway right-of-way used	-0-	-0-	26.5**	16.4**
Scenic Concerns				
Estimated number of residences within 1/2 mile	37	54	439	357
Visibility to highway travelers	low	low	high	moderate
Potential for landscape alteration	low	moderate	low	low
Soil Concerns				
Miles of low constraint soils crossed	3.5	8.9	18.3	17.3
Miles of moderate constraint soils crossed	9.8	15.4	10.3	10.5
Miles of high constraint soils crossed	13.0+	2.0+	-0-+	0.3+
Eligible historic sites affected	-0-	-0-	3	3
Fisheries	very low	very low	low	low
Wildlife	low	low	low	low

* Indicates number of miles adjacent to Laurel to Bridger "A" line.
** Assumes location within Burlington Northern or highway right-of-way. Locations outside of the right-of-way would result in significant increases in the amount of irrigated and dry cropland crossed. The actual miles of each land-use category crossed would depend on final centerline location.
\+ These measurements were made from very general soil association maps which do not show marshes or areas with high water tables, which also pose high constraints. The amount of marsh and saline soils with high water tables crossed by the route centerline were measured on SCS soil series maps and are: Applicant's - 0 miles, Upland - 0.1 mile, Railroad - 6.2 miles, and River - 3.7 miles.

Uplands Route

This route would place the line half to three-quarters of the way up the slope from the valley floor but well below the present "A" line for most of the route. This line could run as close as 80 feet to the "A" line for a distance of about a mile beginning at the new Bridger substation. Another parallel segment begins at a point 2.5 miles east of Rockvale and continues about 10 miles to the Laurel auto substation. About 15 miles of this route would be new corridor.

Railroad Route

This route could be in or next to the Burlington Northern Railroad right-of-way for most of its length. Portions of Highway 310 also would be followed from a point 1.5 miles south of Fromberg to 1 mile south of Edgar. Highway 212 would be followed between Silesia and Laurel.

River Route

The River Route would coincide with the Railroad Route from the Bridger substation to a point 1.5 miles east of Rockvale where it would split off to follow an existing 50-kV line for about 7 miles until it joins the applicant's proposed route. From this point, the route would coincide with the applicant's proposed route to the Laurel substation.

ROUTE COMPARISON

Public Comment on the Routes

Persons attending DNRC's public meetings expressed a general preference for the applicant's proposed route, because it crosses primarily rangeland and could share right-of-way and access roads with an existing MPC transmission line. Alternative routes in the river valley were criticized because of their potential for conflicting with farming operations. The Carbon County

Commission and county planners prefer the applicant's proposed route, because it would minimize conflict with agriculture and residential areas. The commission expressed concern that transmission line location in the river valley area could conflict with existing and future residential subdivisions.

One landowner criticized the proposed route because it would burden the same set of landowners with another transmission line. Several persons questioned MPC's rationale for constructing parallel transmission lines to achieve improved reliability. Another landowner expressed concern over possible conflict with a potetial home site. This would be more of a problem on the Upland Route. Questions also were asked about the possible genetic effects of the transmission line on purebred horses, though DNRC analysis shows that the line will not have any effect.

Other questions concerned the potential tax benefits resulting from project development. Information on the possible tax benefits is included in Appendix A.

Impacts Along Applicant's Proposed and Alternate Routes

All routes evaluated would have similar social and economic impacts.

The nature of general social and economic impacts would not vary substantially from route to route. Short-term economic effects are virtually the same for all routes. MPC's total tax payment and tax benefits would vary only slightly among routes (see Appendix A).

Applicant's Proposed Route

The proposed location along the existing Laurel to Bridger "A" line offers several advantages. This route would have the least risk of impact to fish and wildlife. The line is located far from rivers except where it would cross the Yellowstone and Clarks Fork south of Laurel. Risk to waterfowl at these crossings is small.

Scenic impacts would be lowest for the Applicant's Route. This route is farthest from the valley where most houses and roads are. The line along most of this route would be screened by terrain and would be a long way from most observation points. Visibility increases where portions of the line would be skylined. This would occur primarily from a point east of Rockvale to where the line descends into the Yellowstone River valley.

This route largely avoids residences until it crosses the Yellowstone valley south of Laurel, where subdivision and rural residential development would be encountered. The degree of visual intrusion would vary for residences in this area, with some exposed to views of the line and associated clearing, and others screened by trees and brush. Near the substation, the industrial character of the Laurel refinery and its associated facilities dominate the scene, and the proposed line would be largely unnoticed.

Use of the "A" line's existing access would prevent most visual impacts that could be caused by building new access roads, because little new road building would be required. Location of the new line downslope from the "A" line would reduce the possibility of additional skylined towers.

The route would be in the background as seen from recreation sites. The combination of distance and backdropping by hillsides will cause the line to be barely detectable from these sites.

This route would minimize the amount of land disturbed and largely avoid construction in wet areas and close to the Clarks Fork. Although this route crosses more hilly terrain and problem soils, the use of existing access roads reduces the likelihood of impacts.

At the Clarks Fork and Yellowstone River crossings, care should be taken to avoid placing structures in areas subject to channel movement and to minimize the amount of vegetation cleared adjacent to the river channel. If the applicant's proposed route is selected, structure locations should be selected to avoid or span the landslide area on the south valley wall of Cottonwood Creek just east of the existing transmission line.

The proposed route would have the least impact on historical sites, with a low possibility that any significant archaeological or paleontological sites would be encountered.

This route best avoids areas of human settlement and cultivation, crossing rangeland for most of its length. The "A" line has only four structures on cultivated ground, and the proposed line would probably have about the same. MPC has proposed the use of single-pole structures to cross dryland cultivation and irrigated land. The proposed line would cross the Clarks Fork and Yellowstone River bottomlands next to the "A" line. The existing proximity of the right-of-way might reduce slightly the amount of tree removal required for the new line.

Uplands Route

This route is situated mostly on rolling rangeland and is very similar to the Applicant's Proposed Route. The major difference in the two routes is that the Uplands Route could not use the existing access road network that serves the "A" line, which would result in greater impacts.

The Uplands Route would have slightly greater risk of impacts to fish than the Applicant's Route, with about the same impacts to wildlife.

Scenic impacts would be low for the Uplands Route. Its location in the foothills and out of the valley avoids most residences and places the line in the background of views from highways and most county roads. Most of the line would be either backdropped or screened by foothills on the east side of the valley. Where the proposed line crosses the Bluewater Creek drainage northeast of Bridger, residents would have unobstructed views of the line. Residents living along the county road at the base of the east foothills would be largely screened from view of the line. Visibility increases where portions of the line would be skylined, primarily on the northern end where it coincides with the Applicant's Route. A potential homesite could be affected, depending on where the line is located in this route.

Access roads may cause significant scenic impacts for this route. Graded access roads or trails crossing sidehills would be visible for long distances and could increase erosion problems and reclamation requirements. Until the location of structures and access roads are known, the degree of scenic impact cannot be estimated.

This route's impact on historical resources would be approximately the same as those of the applicant's preferred route. Impacts to other resources would be similar to those for the applicant's proposed route.

Railroad Route

Scenic impacts would be greatest for the Railroad Route. The proposed line would parallel Highways 212 and 310 for most of its length, placing it close to residences along the highway. It would pass through the communities of Fromberg, Edgar, and Silesia, creating an additional visual intrusion. Where the line would parallel the highway, it would be constantly in view with minimal opportunities for screening. The 4-mile portion of this route from north of Edgar to Rock Creek has less potential for visual impacts, with opportunities for vegetative screening along the river and no residences in close proximity. As the line approaches Laurel along the highway, additional residences would be close to the line and impacts would be more severe than for other routes crossing the residential developments south of Laurel.

The route would be close to the Highway 310 rest area, Fromberg Community Park, and Edgar Firemen's Park. All three of these recreation sites are in developed settings, with features such as Highway 310, Burlington Northern railroad track, residences, grain elevators, city streets, and distribution lines nearby. The proposed line is largely compatible with these features, and it is unlikely recreation activity would change any as a result of its presence.

Three historic sites eligible for listing on the National Register of Historic Places would be visually impacted with limited opportunity for avoiding or reducing these impacts.

This route follows the nearly level bottom of the Clarks Fork valley. It crosses the Clarks Fork north of Bridger and would cross the Yellowstone at the Laurel bridge, which would keep waterfowl impacts low. Rock Creek would be crossed 1.5 miles east of Rockvale. The route closely parallels the Clarks Fork between Bridger and Rockvale. Paralleling the river and its floodplain takes the route across several areas of marsh and high water tables north of Silesia and south of Edgar. The highway and railroad could serve as buffers between the river and transmission line, reducing the chance of the river channel moving or probability of damage to the line from ice jamming.

This route could use the Burlington Northern right-of-way for much of its length. This use of an existing right-of-way would avoid many impacts to agriculture. However, several factors may require locations outside the right-of-way. Serious conflicts with agricultural operations and practices would result since adjacent land is primarily irrigated cropland. The railroad right-of-way follows close to the Clarks Fork channel and crosses bottomland containing stands of mature cottonwood trees. Tree removal requirements would depend on centerline location.

The suitability of existing road and railroad right-of-way for transmission line location is questionable. Both the Burlington Northern Railroad and Highway 310 have curves that could require additional support for transmission line structures, such as guy wires or heavier duty components. There are numerous marshes in the borrow pits, making construction and access more difficult.

Routes along road or railroad right-of-way have the potential to cause more radio interference than other routes. The transmission line could interfere with the railroad communication system by inducing an electrical current in its wires (MPC 1984). Cars traveling Highway 310 might be susceptible to radio interference from a transmission line located along the highway right-of-way.

Burlington Northern discourages construction of transmission lines in its right-of-way, perhaps to keep the space available for other developments (MPC 1984). The Montana Department of Highways (DOH) recommends a minimum "clear roadside recovery zone" of 30 feet from the edge of the pavement for motorist

safety, and suggests this zone be wider on curves or where highway embankment slopes are greater than 6:1. Adherence to these restrictions could prevent use of some portions of Highway 310 for transmission line location.

River Route

The River Route coincides with the Railroad Route from the Bridger substation until it splits off near Rock Creek east of Rockvale. The River Route would have the same siting constraints in this area as the Railroad Route as described above. The River Route would present additional impacts as described below. This route would have the most effect on fish and wildlife. It crosses the Clarks Fork three times and the Yellowstone once. Clearing of cottonwoods probably would be required at the river crossings and between Bridger and Fromberg where the line would parallel the river.

This route has many of the same soil and geology constraints as the Railroad Route, but would cross an additional mile of 100-year floodplain near Laurel.

It also would be highly visible to residents in Fromberg and Edgar and those living along Highway 310, with few opportunities for screening. From Edgar to Rock Creek, visibility would be less due to vegetative screening. In the Rock Creek area, several homes would be close to the proposed line. However, impacts would not be severe because dense brush and trees along the river would effectively screen the line for most viewers. From the Clarks Fork crossing to the point where this route joins the routes east of the river, the line would be seen primarily by county road travelers. Few residences would be close to the line. The line would stand out visually where it would cross dry cropland and parallel the existing single-pole 50-kV line with taller, double-pole structures.

This route would share the same recreation impacts as the Railroad Route, but because of the additional crossings has a greater potential for impacts to dispersed recreation such as fishing and waterfowl hunting along the Clarks Fork.

Impacts to historical resources would be the same as those of the Railroad Route.

This route crosses extensive areas of dry cropland before crossing the Clarks Fork southeast of Silesia. The route then crosses about a mile of irrigated cropland before intersecting the Burlington Northern right-of-way east of Rockvale. Impacts to cultivation along this route would be greater than the routes on the upland areas on the east side of the valley.

Conclusion

The applicant's proposed route is a low-impact location for the transmission line. This route has been supported by persons attending the public meeting held by DNRC in December, 1984, and through opinions expressed by persons to MPC's survey of attitudes about transmission line locations. The route avoids most residential areas except near Laurel where one rural subdivision would be crossed to reach the Laurel substation. In this area, the line could be located a safe distance from individual residences. The route's distance from most other areas of human concentration contributes to the route's overall low visual impact.

The route parallels an existing transmission line from Bridger to Laurel. Access roads built for the existing line could be used for the new line, reducing potential for impact. The route primarily crosses rangeland on foothills east of the Clarks Fork valley. Although areas of moderate terrain are crossed, existing access roads will minimize potential soil and erosion impacts. The line would cross the floodplains of the Clarks Fork and Yellowstone River, but structures could be located to minimize potential for impact or problems.

CHAPTER SIX

CONCLUSIONS AND PROPOSED RECOMMENDATIONS

DNRC's conclusions result from a consideration of all the pertinent information available on the proposed project, including the data from MPC and the comments of the public. These conclusions are not final, and could change if new information is presented after publication of this draft EIS. A public meeting will be held to obtain comments on material contained in this document. Written comments also will be accepted from citizens and government agencies receiving copies of this draft EIS.

The proposed recommendations are based on the conclusions, and thus are also subject to change before DNRC makes its final recommendations to the Board.

CONCLUSIONS

1. Operation of the 50-kV system in the Laurel-Bridger-Red Lodge-Columbus area does not meet MPC's reliability criterion under certain outage conditions.

2. The proposed project, along with upgrading of an existing line from 50-kV to 100-kV and the construction of a new substation near Bridger, would provide the necessary reinforcement to satisfy MPC's reliabilty criterion.

3. The benefits from reduced outages to electric consumers served by the 50-kV system are reasonably likely to exceed the costs of the proposed project.

4. The expected net present value of costs for the proposed facility is less than those of other alternatives that could solve the area's electrical problems.

5. Reasonable alternative locations for siting the transmission line were considered.

6. The facility, constructed along either the applicant's proposed route or the Uplands Route, would not cause major adverse or unmitigable social, economic, natural, or physical environmental impacts if the mitigation measures identified in appendix B are adopted.

7. Construction of the facility along MPC's proposed route would cause the least cumulative environmental impact at less economic cost than other reasonable alternatives. This route provides the best balance of factors to be considered using the Board's preferred route criterion.

8. The facility would not cross any designated National wilderness or primitive area.

9. MPC's proposed project can be constructed to minimize risk to public health and safety from electrical noise, electric fields, or other electrical problems such as shocks and radio and television interference.

10. The route proposed by MPC is wide enough to locate a centerline.

11. DNRC consultation with State Aeronautics and FAA during centerline analysis will be required to determine what markings if any are required for pilot safety at crossings of streams and valleys.

12. DNRC concludes that placing the line underground would not be an economically practical method for reducing potential impacts of the project.

PROPOSED RECOMMENDATIONS

1. The Board should grant a Certificate of Environmental Compatibility and Public Need to MPC for construction of the Laurel to Bridger 100-kV transmission line.

2. The proposed project should be built on MPC's preferred route.

3. The Board, in approving any route, should attach requirements for reducing or avoiding impacts, including erosion, sedimentation, weeds, and impacts to wildlife, visual, historical, and archaeological resources. These measures are included in DNRC's Transmission Line Construction Specifications, Appendix B.

4. MPC should apply for and the Board should approve a final centerline within the selected route before construction begins, as provided in adopted administrative rules and legislative changes to the Siting Act. At the time of route certification, work could begin to install additional equipment required at the Laurel-to-Bridger automatic substations.

5. MPC and DNRC should develop a program for monitoring construction to be submitted for Board consideration at the time of centerline approval.

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APPENDIX A

Possible Tax Benefits from the Proposed Project

APPENDIX A

The following tables present summary information regarding possible tax benefits from the Laurel to Bridger project. These figures were calculated from data supplied in MPC's application. It should be noted that taxable values of transmission lines are subject to adjustment based on values of utility stock and profits. Property tax benefits resulting from project development may be lower than estimated.

Table 1. Estimated Length and Construction Costs for Alternate Routes (in dollars at their 1985 value)

Route	Approximate Transmission Miles	Estimated Transmission Costs	Estimated Substation Costs	Total Estimated Costs
Railroad	28.6	1,898,300	430,000	2,328,300
River	28.5	1,892,000	430,000	2,322,000
Uplands	26.4	1.759,400	430,000	2,189,400
Applicant's Proposed	26.4	1,759,400	430,000	2,189,000

Source: Montana Power Company, 1984

Table 2. Taxable Valuations for Selected Taxing Jurisdictions 1980-1984 (in 1000s of dollars)

	Fiscal Year 1980	Fiscal Year 1984	% change 1980-1984
Jurisdiction			
Counties			
Yellowstone	$180,956	$201,971	+12%
Carbon	20,883	28,234	+35%
Cities			
Fromberg	281	299	+ 6%
School Districts			
Laurel Elementary	16,305	15,326	- 6%
Laurel High School	15,981	15,053	- 6%
Edgar Elementary	908	850	- 6%
Fromberg Elementary	1,237	1,144	- 8%
Fromberg High School	1,942	1,798	- 7%
Bridger Elementary	4,398	5,941	+35%
Bridger High School	4,398	5,941	+35%

Source: Don Dooley, Local Government Services Division, Montana Department of Commerce
Steve Colberg, Office of the Montana Superintendent of Public Instruction

Table 3. Projected Taxable Value Increases by Taxing Jurisdictions for Alternative Routes

	Railroad	River	Uplands	Applicant's Proposed
Jurisdictions				
Counties				
Yellowstone	$ 44,000	$ 69,000	$ 71,000	$ 71,000
Carbon	181,000	155,000	139,000	139,000
Cities				
Fromberg	6,000	6,000	---	---
School Districts				
Laurel Elem.	117,000	116,000	100,000	97,000
Laurel H.S.	103,000	102,000	100,000	97,000
Edgar Elem.	20,000	20,000	32,000	32,000
Fromberg Elem	47,000	47,000	43,000	41,000
Fromberg H.S.	82,000	82,000	75,000	73,000
Bridger Elem.	40,000	40,000	34,00	40,000
Bridger H.S.	40,000	40,000	34,000	40,000
Total Taxable Value	$225,000	$223,000	$210,000	$210,000

Source: Supplemental Report No. 1, MPC, 1984.

Table 4. Percent Increase in Taxable Valuation by Taxing Jurisdiction for Alternative Routes

	Railroad	River	Uplands	Applicant's Proposed
Jurisdiction				
Counties				
Yellowstone	+0.02%	+0.03%	+0.04%	+0.04%
Carbon	+0.6%	+0.6%	+0.5%	+0.5%
Cities				
Fromberg	+2.1%	+2.1%	0.0%	0.0%
School Districts				
Laurel Elem.	+0.8%	+0.8%	+0.7%	+0.6%
Laurel H.S.	+0.7%	+0.7%	+0.7%	+0.6%
Edgar Elem.	+2.4%	+2.4%	+3.8%	+3.6%
Fromberg Elem.	+4.1%	+4.1%	+3.8%	+3.6%
Fromberg H.S.	+4.6%	+4.6%	+4.2%	+4.1%
Bridger Elem.	+0.7%	+0.7%	+0.6%	+0.7%
Bridger H.S.	+0.7%	+0.7%	+0.6%	+0.7%

Table 5. Increase in projected Property Tax Revenues by Taxing Jurisdiction for Alterntive Routes (based on 1984-85 mill rates)

	Railroad	River	Uplands	Applicant's Proposed
Jurisdiction				
Counties				
Yellowstone	$ 2,650	$ 4,160	$ 4,2780	$ 4,280
Carbon	9,690	8,300	7,440	7,440
Cities				
Frombrg	410	410	---	---
School Districts				
Laurel Elem.	6,800	6,750	5,820	5,640
Laurel H.S.	4,300	4,270	4,180	4,060
Edgar Elem.	1,150	1,150	1,850	1,850
Fromberg Elem.	3,380	3,380	3,050	2,900
Fromberg H.S.	4,780	4,780	4,380	4,260
Bridger Elem.	2,030	2,030	1,730	1,520
Bridger H.S.	1,520	1,520	1,290	1,520
Total Payments	$36,680	$36,700	$34,010	$33,980

APPENDIX B

Proposed Environmental Specifications for the Laurel to Bridger Project

STATE OF MONTANA
ENVIRONMENTAL SPECIFICATIONS FOR THE
LAUREL TO BRIDGER 100-KV TRANSMISSION LINE
Revised, May 1985

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2.14 Waste disposal
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3.3 Monitoring

4.0 OPERATION AND MAINTENANCE

4.1 Right-of-way management and road maintenance
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4.3 Correction of landowner problems
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DEFINITIONS

ACCESS EASEMENT: Any land area over which the OWNER has received an easement from a landowner allowing travel to and from the project. Access easements may or may not include access roads.

ACCESS ROAD: Any travel course which is constructed by substantial recontouring of land and which is intended to permit passage by most four-wheeled vehicles.

BEGINNING OF CONSTRUCTION: Any project-related earthmoving or removal of vegetation (except for clearing of survey lines)

BOARD: Montana BOARD of Natural Resources and Conservation

CONTRACTOR: Constructors of the Facility (agent of owner)

DFWP: Montana Department of Fish, Wildlife, and Parks

DHES: Montana Department of Health and Environmental Sciences

DNRC: Montana Department of Natural Resources and Conservation

DOH: Montana Department of Highways

DSL: Montana Department of State Lands

EXEMPT FACILITY: A facility meeting the requirements of 75-20-202, MCA and accompanying rules

LANDOWNER: The owner of private property or the managing agency for public lands

OWNER: The owner(s) of the facility, or the owner's agent

SENSITIVE AREA: Area which exhibits environmental characteristics that may make them susceptible to impact from construction of a transmission facility. The extent of these areas are defined for each project but may include any of the areas listed in 36.7.2533 or 36.7.2534 ARM as "sensitive areas" or "areas of concern."

SHPO: State Historic Preservation Office

PREFACE

For any transmission facility approved by the Board of Natural Resources and Conservation, a set of environmental specifications must be developed jointly by the applicant and DNRC and included in the Certificate of Environmental Compatibility and Public Need.

For a specific project, draft language for those environmental specifications which apply to the entire project is developed prior to publication of the draft EIS. This language is then subjected to public review in the DEIS, revised for the final EIS, and approved by the Board at the time of route approval. Site-specific measures, which cannot be specified until after detailed centerline study, must be included in the Certificate at the time the Board approves a final centerline for the facility.

The purpose of this document is to provide a checklist and suggested language for non-site-specific environmental specifications (items 0.0 through 4.5.2), and a checklist of types of site-specific data which typically need to be worked out during centerline study (Appendices A through P). This approach can greatly facilitate the preparation of a project-specific set of environmental specifications for Board approval. This document has been written to include suggested language for most environmental specifications typically employed to mitigate impacts of transmission lines of all voltages above 100 kV. These specifications are those which DNRC and BNRC have found necessary to ensure environmental protection during construction and operation of transmission facilities. The language included has been carefully worded to be suitable for most projects, but it is anticipated that certain minor modifications will be needed to accommodate a specific project of a certain voltage located in a certain portion of the state. Certain of the measures listed may not apply and may therefore be deleted; additional measures may be added as a result of public and agency involvement. It is intended that this document will be used as the starting point for discussions between an applicant and DNRC in preparing a final set of environmental specifications to be included in the DEIS on a specific project.

A number of site-specific attachments (Appendices A through P) are listed herein; it is intended that language for these attachments will be worked out jointly by DNRC and the applicant during centerline study. The site-specific attachments required for a given project may be quite different from the list suggested in this document and may differ considerably from project to project.

It should be emphasized that this document is merely a suggested starting point for discussion. It has no legal standing and imposes no requirements upon an applicant; ~~this~~ legal standing comes about when a revised version of this document is approved by the Board for a specific project certified under MFSA.

INTRODUCTION

The purpose of these specifications is to ensure mitigation of potential environmental impacts during the construction, operation, and maintenance of a transmission facility. These specifications are intended to be incorporated into the texts of contract plans and specifications.

For non-exempt facilities, the Montana Major Facility Siting Act supercedes all state environmental permit requirements except for those dealing with air and water quality, public health and safety, water appropriations and diversions, and easements across state lands (75-20-103 and 401, MCA). A major purpose of these specifications is to ensure that the intent of the laws which are superceded is met, even though the procedures of applying for and obtaining permits from various state agencies are not. As specified later in this document, the State Inspector will have the responsibility for arranging reviews and inspections by other state agencies which would otherwise have been done through a permit application process.

Appendices A through P refer to the site-specific concerns and areas that apply for a specific project. These appendices, as needed, will be prepared by the OWNER working in consultation with the Department prior to Board approval of a centerline for a particular project.

0.0 GENERAL SPECIFICATIONS

0.1 SCOPE These specifications apply to all lands affected by the project. Where the landowner requests practises other than those listed in these specifications, the OWNER may authorize such a change provided that the STATE INSPECTOR is notified in writing of the change and that the change would not be in violation of: (1) the intent of any state law which is superceded by the Montana Major Facility Siting Act; (2) the Certificate; (3) any conditions imposed by the BOARD; or (4) the BOARD's finding of minimum adverse impact; or (5) the regulations in 36.7.5501 and 5502, ARM.

0.2 ENVIRONMENTAL PROTECTION The OWNER shall conduct all operations in a manner to protect the quality of the environment and to reduce impacts to the greatest extent practical.

0.3 CONTRACT DOCUMENTS These specifications shall be part of or incorporated into the contract documents; therefore, the OWNER and the OWNER'S agents shall be held responsible for adherence to these specifications in performing the work. If the OWNER'S agents fail to operate within the intent of these specifications, the BOARD or its authorized agent shall direct the OWNER to comply. Continued violation may result in a civil penalty of up to $10,000 per day pursuant to 75-20-408, MCA.

0.4 BRIEFING OF EMPLOYEES The OWNER shall ensure that the CONTRACTOR and all field supervisors are provided with a copy of these specifications and informed of which sections are applicable to specific procedures. ~~The OWNER shall require that its construction supervisors are adequately trained and utilized in work appropriate to that training.~~ It is the responsibility of the OWNER, its CONTRACTOR, and CONSTRUCTION SUPERVISORS to ensure that the intent of these measures are met. Supervisors shall inform all employees on the applicable environmental constraints spelled out herein prior to and during construction. Site-specific measures spelled out in the appendices attached hereto shall be incorporated into the design and construction specifications or other appropriate contract document.

0.5 COMPLIANCE WITH REGULATIONS All project-related activities of the OWNER shall comply with all applicable local, state, and federal laws, regulations, and requirements. A non-exempt facility which has received a Certificate of Environmental Compatibility and Public Need from the BNRC does not need to obtain environmental permits from state agencies with the exception of laws dealing with air or water quality, protection of employees, surface and groundwater diversions, and easements across school trust lands, or the beds of navigable streams or rivers, as provided by 75-20-103 and 401, MCA. Rule 36.7.5502, ARM, describes monitoring requirements for electric transmission lines. Compliance with the requirements of these regulations and environmental specifications will ensure that the intent of state laws which are superceded by MFSA is met.

0.6. LIMITS OF LIABILITY

The OWNER is not responsible for correction of environmental damage or destruction of property caused by negligent acts of DNRC employees during construction monitoring activities.

0.67 DESIGNATION OF SENSITIVE AREAS The DNRC, in its evaluation of the project, has designated certain areas along the right-of-way or access roads as SENSITIVE AREAS. The location of all such SENSITIVE AREAS is described in Appendix A. Special precautions shall be taken in these areas during construction, operation, and maintenance, as described elsewhere in these specifications (see sections 1.1.2, 2.1.5, 2.1.6, 2.2.2, 2.9.3, 3.2.8, and 4.1.1) or in the attached appendices. The OWNER shall take all reasonable actions to avoid adverse impacts in these SENSITIVE AREAS.

0.~~7~~8 PERFORMANCE BOND~~S~~ To ensure compliance with these specifications, the OWNER shall submit to the State of Montana or its authorized agent a ~~RESTORATION~~ BOND or bonds pertaining specifically to the restoration of the right-of-way and adjacent land damaged during construction. ~~The entire RESTORATION BOND shall be held until~~ Post-construction monitoring by DNRC ~~indicates that~~ will determine compliance with these specifications and other mitigating measures ~~have been followed, that~~ included herein. At the time cleanup and restoration are complete, and ~~that~~ revegetation is progressing satisfactorily, ~~at which time~~ the OWNER shall be released from ~~the RESTORATION BOND~~his obligation for restoration. At the time the OWNER is released, a portion of this BOND or a separate BOND shall be established by the OWNER and ~~shall~~ submitted to the State of Montana or its authorized agent. This BOND shall ~~a RECLAMATION BOND to~~ be held for five years or until monitoring by DNRC indicates that reclamation and road closures have been adequate. The amount ~~of the two performance bonds mentioned above~~ and bonding mechanisms for this section shall be agreed to by the BOARD and OWNER under provisions established by 36.7.4006(2) ARM. The amounts of BOND or BONDS shall be as specified in Appendix B and attached. Proof of bond shall be submitted to DNRC.

0.~~8~~9 DESIGNATION OF STRUCTURES Each structure for the project shall be designated by a unique number on plan and profile maps. References to specific poles or towers in Appendices A through P shall use these numbers. If this information is not available because the survey is not complete, locations along the centerline shall be indicated by station numbers or mileposts. Station numbers or mileposts of all angle points shall be designated on plan and profile maps.

0.~~9~~10 ACCESS When easements for construction access are obtained for construction personnel, provision will be made by the OWNER to ensure that DNRC personnel will be allowed access to the right-of-way and to any off-right-of-way access roads used for construction during the term of the ~~RESTORATION BOND~~BOND(S) required by 36.7.4006(2), ARM. Liability for damage caused by providing such access for the STATE INSPECTOR shall be limited by section 0.6 Limits of Liability.

0.~~10~~11 DESIGNATION OF STATE INSPECTOR ~~Prior to the beginning of construction,~~ DNRC shall designate a STATE INSPECTOR or INSPECTORS to monitor the OWNER'S compliance with these specifications and any other project-specific mitigation measures adopted by the BOARD as provided in 36.7.5502(1), ARM. The STATE INSPECTOR shall be the OWNER's liaison with the State of Montana on construction, post-construction, and reclamation activities. All communications regarding the project shall be directed to the STATE INSPECTOR. The name of the STATE INSPECTOR can be obtained by contacting the Administrator of the Energy Division, DNRC.

~~For non-exempt facilities, responsibilities of the STATE INSPECTOR include but are not limited to:~~

~~1)~~ ~~Review of plan and profile drawings submitted by the OWNER.~~

~~2)~~ ~~Granting of any waivers to the advance notification requirements contained in Section 1.0 of these specifications.~~

~~3)~~ ~~Field inspection of construction activity and those sites identified in the centerline evaluation as requiring specific construction techniques or precautions.~~

~~4)~~ ~~Determining compliance with these specifications.~~

~~5)~~ ~~Documentation of field observations and discussions with CONTRACTOR and/or OWNER's representative.~~

~~6)~~ ~~Preparation of periodic monitoring reports, and reports in support of bond release, retention, or forfeiture.~~

~~7)~~ ~~Authorizing release of RESTORATION or REGLAMATION BONDS.~~

~~8)~~ ~~Contacting other state agencies and arranging review or inspections by them as necessary.~~

For exempt facilities, the extent of involvement of the STATE INSPECTOR shall be established at the preconstruction conference (section 1.2.).

0.~~11~~12 SALVAGE Removal of existing structures replaced by the present line, or removal of the present line following its abandonment, shall be done in accordance with these specifications. Removal of any unused existing structures, if necessary, shall be done within twelve months after energization of the new line, unless written provision to extend this period is received from the Director, DNRC.

0.13 OTHER Adoption of other measures may be required for project approval at the time of certification. These special measures shall be incorporated herein (see 2.15 SPECIAL MEASURES).

1.0 PRECONSTRUCTION PLANNING AND COORDINATION

1.1 PLANNING

1.1.1 Planning of all stages of construction and maintenance activities is essential to ensure that construction-related impacts will be kept to a minimum. The CONTRACTOR and OWNER ~~will~~ shall, to the extent possible, plan the timing of construction, construction and maintenance access and requirements, location of special use sites, and other details before the commencement of construction.

1.1.2. Preferably thirty days, but at least fifteen days b~~B~~efore the start of construction ~~of any segment of the line~~, the OWNER shall submit plan and profile map(s) depicting the location of the centerline and of all construction access roads, maintenance access roads, structures, clearing backlines, and, if known, special use site. The scale of the map shall be 1:24,000 or larger.

1.1.3. If special use sites are not known at the time of submission of the plan and profile, the following information shall be submitted no later than five days prior to the start of construction. The location of special use sites including staging sites, pulling sites, batch plant sites, splicing sites, borrow pits, campsites, and storage or other buildings shall be plotted on one of the following and submitted to the Department: ortho photomosaics of a scale 1:24,000 or larger, or available USGS 7.5' plan and profile maps of a scale 1:24,000 or larger.

1.1.4. Changes or updates to the information submitted in 1.1.2. and 1.1.3. shall be submitted to the Department as they become available. In no case shall a change be submitted less than five days prior to its anticipated date of construction. ~~staging sites, pulling sites, (if known) batch plant sites, splicing sites, (if known), borrow pits, campsites, and storage or other buildings shall be plotted on ortho photomosaics and/or plan and profile maps, at a scale of 1:24,000 or larger, or on available USGS 7.5' topographic maps (scale: 1:24,000), and submitted to the STATE INSPECTOR. All locations shall be submitted at least 14 days before the beginning of construction at the site. The STATE INSPECTOR shall be notified of any~~ cChanges in these locations prior to construction ~~(~~where designated SENSITIVE AREAS are affected, ~~these changes~~ must be submitted to the DNRC 7 days before construction and approved by the STATE INSPECTOR prior to construction.~~)~~

~~1.1.3 For lines of a design voltage 230 kV and above, the OWNER shall provide to DNRC: (1) a list of contractors and, where known, subcontractors; (2) an estimate of the number of workers; (3) description of the types of heavy equipment required; and (4) a proposed time schedule of construction activities. This information shall be submitted prior to the preconstruction conference for each segment of line. DNRC is to be notified immediately of any significant changes or updates in the proposed time schedule.~~

1.1.45. Long-term maintenance routes to all points on the line should be planned before construction begins. Where known, new construction access roads intended to be maintained for permanent use shall be differentiated from temporary access roads on the maps required under 1.1.2 above.

1.2 PRECONSTRUCTION CONFERENCE

1.2.1. At least one week before commencement of any construction activities, the OWNER shall schedule a preconstruction conference. The STATE INSPECTOR shall be notified of the date and location for this meeting. One of the purposes of this conference shall be to brief ~~all involved persons~~ the CONTRACTOR and land management agencies regarding the content of these specifications and other BOARD-approved mitigating measures, and to make all parties aware of the roles of the STATE INSPECTOR and of the federal inspectors (if any).

1.2.2. The OWNER's representative, the CONTRACTOR's representative, the STATE INSPECTOR, and representatives of affected state and federal agencies who have land management or permit and easement responsibilities shall be invited to attend the preconstruction conference.

1.3 PUBLIC CONTACT

1.3.1. ~~For all lines of a design voltage of 230 kV or above,~~ Written notification by the OWNER'S field representative or the CONTRACTOR ~~shall meet with~~ shall be given to local public officials in each affected community prior to the beginning of construction to provide information on the temporary increase in population, when the increase is expected, and where the workers will be stationed. If further information is required by local officials, the OWNER shall hold a meeting to discuss potential temporary changes. Officials contacted shall include the county commissioners, city administrators, and law enforcement officials. It is also suggested that local fire departments, emergency service providers, school officials, motel operators and others who could provide transient lodging, and a representative of the Chamber of Commerce be contacted. ~~Maps of the line and access roads must be available so that service providers can determine where and when any problems could arise.~~

~~1.3.2. For lines of a design voltage 230 kV and above, if there is a potential problem relating to inadequate housing, schools, or other facilities, or services, the OWNER shall require that the CONTRACTOR inform workers as they arrive, advising them where adequate facilities may be found. The OWNER shall inform the CONTRACTOR of the availability of services (such as an emergency fire protection or ambulance) that might be needed during construction.~~

1.3.42. The OWNER shall negotiate with the landowner in determining the best location for access easements, and the need for gates.

1.3.53. The OWNER shall contact local government officials, or the managing agency, as appropriate, regarding implementation of required traffic safety measures.

1.4. HISTORICAL AND ARCHAEOLOGICAL SURVEY.

1.4.1. The OWNER must develop and carry out a plan approved by the State Historic Preservation Office (SHPO) that includes steps which have been and will be taken to identify, evaluate, and avoid or mitigate damage to cultural resources affected by the project. The plan (Appendix I) shall include: (1) actions taken to identify cultural resources during initial intensive survey work; (2) an evaluation of the significance of the identified sites and likely impacts caused by the project; (3) recommended treatments or measures to avoid or mitigate damage to known cultural sites; (4) steps to be taken in the event other sites are identified after approval of the plan; and (5) provisions for monitoring construction to protect cultural resources. Except for monitoring, all steps of the plan must be carried out prior to the start of construction. The requirement for this plan should not be construed to exempt or alter compliance by the OWNER or managing agency with 36 CFR 800. This plan must be filed with SHPO.

2.0 CONSTRUCTION

2.1 GENERAL

2.1.1. The preservation of the natural landscape contours and environmental features shall be an important consideration in the location of all construction facilities, including roads, construction camps, storage areas, and buildings. Construction of these facilities shall be planned and conducted so as to minimize destruction, scarring, or defacing of the natural vegetation and landscape. Any necessary earthmoving shall be planned and designed to be as compatible as possible with the natural landforms.

2.1.2. Temporary construction sites and staging areas shall be kept to the minimum size necessary to perform the work. Such areas shall be located where most environmentally compatible, considering slope, fragile soils or vegetation, and risk of erosion. After construction, these areas shall be restored as specified in Section 3.0 of these specifications unless a specific exemption is authorized in writing by the STATE INSPECTOR.

2.1.3. All work areas shall be maintained in a neat, clean, and sanitary condition at all times. Trash or construction debris (in addition to solid wastes described in section 2.14) shall be regularly removed during the construction and reclamation periods.

2.1.4. In areas where mixing of soil horizons would lead to a significant reduction in soil productivity, increased difficulty in establishing permanent vegetation, or an increase in weeds, mixing of soil horizons shall be avoided insofar as possible. This may be done by removing and stockpiling topsoil, where practical, so that it may be spread over subsoil during site restoration. Known areas where stockpiling of topsoil is required are listed in Appendix L. Other areas may be designated by the STATE INSPECTOR prior to construction.

2.1.5. ~~SENSITIVE AREAS listed in Appendix A, and all cultivated and planted areas and~~ vVegetation such as trees, plants, shrubs, and grass on or adjacent to the right-of-way which do not interfere with the performance of construction work, or operation of the line itself shall be preserved. ~~The OWNER shall take all necessary actions to avoid adverse impacts to SENSITIVE AREAS. The STATE INSPECTOR shall be notified two working days in advance of initial clearing or construction activity in these areas.~~

2.1.6 The OWNER shall take all necessary actions to avoid adverse impacts to SENSITIVE AREAS listed in Appendix A. The STATE INSPECTOR shall be notified two working days in advance of initial clearing or construction activity in these areas. The OWNER shall mark or flag the clearing backlines and limits of disturbance in certain SENSITIVE AREAS as designated in Appendix A. All construction activities must be conducted within this marked area.

2.1.7. The OWNER shall either acquire appropriate land rights ~~that cover as much as is practical of~~ or provide compensation for damage for the land area that will be disturbed by construction. The width of the area disturbed by construction ~~easement for~~ shall not exceed a reasonable distance from the centerline as necessary to perform the work. For this project ~~shall be as~~ construction activities should be contained within the area specified in Appendix C ~~unless otherwise indicated~~.

2.1.8. Flow in a streamcourse may not be permanently diverted. If temporary diversion is necessary, flow will be restored before a major runoff season or the next spawning season, as determined by the STATE INSPECTOR in consultation with the managing agency (see 2.11.6).

2.2 CONSTRUCTION MONITORING

2.2.1. ~~After the BOARD approves the OWNER's centerline location, the responsibility for follow-up actions lies with the STATE INSPECTOR. These actions consist of communication with the CONTRACTOR and OWNER's representative, documentation of field observations, and preparation of monitoring and bond release reports. The STATE INSPECTOR shall maintain discussions with the OWNER and the OWNER's agents in order to stay informed of construction activities in areas of concern to the state. The STATE INSPECTOR will observe construction at these areas when possible and necessary, and shall monitor OWNER compliance with the State Environmental Specifications and project specific mitigating measures.~~The STATE INSPECTOR is responsible for implementing the monitoring plan required by 36.7.5501(1), ARM. The plan specifies the type of monitoring data and activities required and terms and schedules of monitoring data collection, and assigns responsibilities for data collections, inspection reporting, and other monitoring activities. It is attached as Appendix Q.21

2.2.2. The STATE INSPECTOR, the OWNER, and the OWNER'S agents will rely upon a cooperative working relationship to reconcile potential problems relating to construction in SENSITIVE AREAS and compliance with these specifications. ~~Enforcement action will occur when the OWNER or OWNER's agent violates the substance of these specifications.~~ When ~~the STATE INSPECTOR determines that~~ construction activities will cause excessive environmental impacts due to seasonal field conditions or encounters with sensitive features, ~~he~~ the STATE INSPECTOR will talk with the OWNER about possible mitigating measures or minor construction rescheduling to avoid these impacts. The STATE INSPECTOR will be prepared to provide the OWNER with written documentation of the reasons for the modifications within 24 hours of their imposition. ~~The STATE INSPECTOR will use the following administration tools:~~

~~2.2.3. The STATE INSPECTOR may, where necessary, issue COMPLIANCE ORDERS to the OWNER's representative. A COMPLIANCE ORDER is a directive used to advise the OWNER of the need to comply with specific elements of these specifications or other project mitigation measures. The COMPLIANCE ORDER may also be instructional in nature. All orders shall be in writing, but in emergencies may be issued orally provided written confirmation is made within 24 hours. In the event that the OWNER fails to comply with a valid COMPLIANCE ORDER and fails to provide acceptable evidence that he will comply, the STATE INSPECTOR shall file an incident report to the DNRC Director within two working days. Subsequent legal judgments against the OWNER may result in civil penalties up to $10,000 per day of continued violation, in accordance with 75-20-408, MCA.~~

2.2.43. The STATE INSPECTOR may require mitigation measures or procedures at some sites beyond those listed in Appendix A in order to minimize environmental damage due to unique circumstances that arise during construction, such as unanticipated discovery of a cultural site. The STATE INSPECTOR will ~~issue written instructions to the OWNER for all such locations after consultation with the OWNER's representative~~follow procedures described in the monitoring plan when such situations arise.

2.2.4. In the event that the STATE INSPECTOR shows reasonable cause that compliance with the BOARD conditions or these specifications is not being achieved, the Department would take corrective action as described in 36.7.5502(9) and (10), ARM.

2.3 TIMING OF CONSTRUCTION

2.3.1. Construction and motorized travel ~~will~~may be restricted or prohibited at certain times of the year in certain areas. Exemptions to these timing restrictions may be granted by DNRC in writing if the OWNER can clearly demonstrate that no environmental impacts will occur as a result. These areas, listed in Appendix D, ~~may~~ include ~~but are not limited to the following~~ areas deemed as sensitive areas and areas of concern in 36.7.2533 or 36.7.2534 ARM:

~~a. The vicinity of heavily used recreation sites on weekends or holidays;~~

~~b. On or near winter ranges or other areas important to moose, elk, deer, antelope, mountain sheep, and mountain goats;~~

~~c. Sage and sharp-tailed grouse leks;~~

~~d. Raptor nesting sites or water bird colonies;~~

~~e. In or near streams during seasons of migratory fish spawning;~~

~~f. Areas with soils having low bearing strength when wet.~~

2.3.2. In order to prevent rutting and excessive damage to vegetation, construction will not take place during periods of high soil moisture when ~~irreversible damage will occur~~construction vehicles will cause severe rutting requiring extensive reclamation.

2.4 PUBLIC SAFETY

2.4.1. All construction activities shall be done in compliance with existing health and safety laws.

2.4.2. Requirements for aeronautical hazard marking shall be determined by the OWNER in consultation with the Montana Aeronautical Division, the FAA, and DNRC. These requirements are listed in Appendix E. Where required, aeronautical hazard markings shall be installed at the time the wires are strung, according to the specifications listed in Appendix E.

2.4.3. Noise levels shall not exceed established BOARD standards as a result of operation of the ~~transmission line~~facility and associated facilities. For electric transmission facilities, the average annual noise levels, as expressed by an A-weighted day-night scale (Ldn) will not exceed (a) 50 decibels at the edge of the right-of-way in residential and subdivided areas unless the affected landowner waives this condition, and (b) 55 decibels at the edge of property boundaries of substations in residential and subdivided areas.

2.4.4. The facility shall be designed, constructed, and operated to adhere to the National Electric Safety Codes regarding transmission lines.

2.4.5. The electric field at the edge of the right-of-way will not exceed 1 kilovolt per meter measured 1 meter above the ground in residential or subdivided areas unless the affected landowner waives this condition, and that the electric field at road crossings under the facility will not exceed 7 kilovolts per meters measured 1 meter above the ground.

2.5 PROTECTION OF PROPERTY

2.5.1. Construction operations shall not take place over or upon the right-of-way of any railroad, public road, public trail, or other public property until negotiations and/or necessary approvals have been completed with the managing agency. Designated recreational trails as listed in Appendix A will be protected and kept open for public use. Where it is necessary to cross a trail with access roads, the trail corridor will be restored. Adequate signing and/or blazes will be established so the user can find the route. All roads and trails designated by government agencies as needed for fire protection or other purposes shall be kept free of logs, brush, and debris resulting from operations under this agreement. Any such road or trail damaged by this project shall be promptly restored as nearly as possible to its original condition.

2.5.2. Reasonable precautions shall be taken to protect, in place, all public land monuments and private property corners or boundary markers. If any such land markers or monuments are destroyed, ~~the STATE INSPECTOR shall be notified immediately and~~ the marker shall be reestablished and referenced in accordance with the procedures outlined in the "Manual of Instruction for the Survey of the Public Land of the United States" or, in the case of private property, the specifications of the county engineer. Reestablishment will be at the expense of the OWNER.

2.5.3. Construction shall be conducted so as to prevent any damage to existing real property including transmission lines, distribution lines, telephone lines, railroads, ditches, and public roads crossed. If such property is damaged by operations under this agreement, the OWNER shall repair such damage immediately to a reasonably satisfactory condition in consultation with the property owner.

2.5.4. In areas with livestock, the OWNER shall make a reasonable effort to comply with the reasonable requests of landowners regarding measures to control livestock. Ceare shall be taken to ensure that all gates are reclosed after entry or exit and the landowner shall be compensated for any losses to personal property due to construction or maintenance activities. Gates shall be inspected and repaired when necessary during construction and missing padlocks shall be replaced. ~~when requested by landowner.~~ The OWNER shall ensure that gates are not left open at night or during periods of no construction activity. Any fencing or gates cut, removed, damaged, or destroyed by the OWNER shall immediately be replaced with new materials. Fences installed shall be of the same height and general type as the fence replaced or nearby fence on the same property, and shall be stretched tight with a fence stretcher before stapling or securing to the fence posts. ~~, subject to the desires of the landowner.~~ Temporary gates shall be of sufficiently high quality to withstand repeated opening and closing during construction, to the satisfaction of the landowner.

2.5.5. The CONTRACTOR must notify the OWNER, the STATE INSPECTOR, and, if possible, the affected landowner within two working days damage to land, crops, property, or irrigation facilities, contamination or degradation of water, or livestock injury caused by the OWNER's construction activities, and the OWNER shall reasonably restore any damaged resource or property or provide reasonable compensation to the affected party.

2.5.6. Pole holes and anchor holes must be covered or fenced in any fields, pastures, or ranges used for livestock grazing or where ~~the~~ a landowner's requests can be reasonably accommodated ~~it~~.

2.5.7. When requested by the landowner, Aall fences crossed by permanent access roads shall be provided with a gate ~~of a width satisfactory to the landowner~~. All fences to be crossed by access roads shall be braced before the fence is cut. Fences not to be gated should be restrung temporarily during construction and permanently within 30 days following construction, subject to the reasonable desires of the landowner.

2.5.8. ~~Gates or other means of restricting livestock movement shall be placed w~~Where new access roads cross fencelines ~~as requested by the landowner~~, the OWNER shall make reasonable effort to accommodate the landowner's wishes on gate location and width.

2.5.9. Any breaching of natural barriers to livestock movement by construction activities will require fencing sufficient to control livestock.

2.6 TRAFFIC CONTROL

2.6.1. At least 30 days before any construction within or over any state or federal highway right-of-way, the OWNER will notify the ~~STATE INSPECTOR. The STATE INSPECTOR will arrange an on-site inspection with the OWNER and a representative of the~~ appropriate DOH field office to review the proposed occupancy and to resolve any problems. ~~The STATE INSPECTOR will prepare recommendations based on consultation with DOH.~~ The OWNER must ~~comply with~~ supply DNRC with documentation that this consultation has occurred. This documentation should include any measures recommended by ~~the STATE INSPECTOR following this inspection, including measures related to traffic control requirements~~DOH and to what extent the OWNER has agreed to comply with these measures. In the event that recommendations or regulations were not followed, a statement as to why the OWNER chose not to follow them should be included.

2.6.2. In areas where the construction creates a hazard, traffic will be controlled according to the ~~recommendations mentioned in Section 2.6.1.~~applicable DOH regulations. Safety signs advising motorists of construction equipment shall be placed on major state highways, as recommended by DOH. The installation of proper road signing will be the responsibility of the OWNER.

2.6.3. The managing agency shall be ~~given adequate notice~~ notified, as soon as practicable, when it is necessary to close public roads to public travel for short periods to provide safety during construction.

2.6.4. Construction vehicles and equipment will be operated at speeds safe for existing road and traffic conditions. ~~Speed limits will be posted as approved by DOH or the managing agency.~~

2.6.5. Traffic delays will be restricted on primary access routes, as determined by the DOH or the managing agency.

2.6.6. Access for fire and emergency vehicles will be provided for at all times.

2.6.7. Public travel through and use of active construction areas shall be limited at the discretion of the managing agency.

2.7 ACCESS ROADS AND VEHICLE MOVEMENT

2.7.1. Construction of new roads shall be held to the minimum reasonably required to construct and maintain the facility. State, county, and other existing roads shall be used for construction access wherever possible. Access roads intended to be permanent should be initially designed as such. The location of access roads and towers shall be established in consultation with affected landowners and landowner concerns shall be accommodated where~~ver~~ reasonably possible and not in contradiction to these specifications or other BOARD conditions.

2.7.2. All new roads, both temporary and permanent, shall be constructed with the minimum possible clearing and soil disturbance to minimize erosion, as specified in Section 2.11 of these specifications.

2.7.3. Where practical, all roads shall be initially designed to accommodate one-way travel of the largest piece of equipment that will eventually be required to use them; road width shall be no wider than necessary.

2.7.4. Roads shall be located in the right-of-way insofar as possible. Travel outside the right-of-way to enable traffic to avoid cables and conductors during conductor-stringing shall be kept to the minimum possible. Road crossings of the right-of-way should be near support structures.

2.7.5. Where practical, temporary roads shall be constructed on the most level land available. Where temporary roads cross flat land they shall not be graded or bladed unless necessary, but will be flagged or otherwise marked to show their location and to prevent travel off the roadway.

2.7.6. In order to minimize soil disturbance and erosion potential, no cutting and filling for access road construction shall be allowed in areas of up to 5 percent sideslope ~~or less~~. In areas of over 5 percent sideslope, roadbuilding that may be required shall conform to a 4 percent outslope. The roads shall be constructed to prevent channeling of runoff, and shoulders or berms that would channel runoff shall be avoided.

2.7.7. The OWNER will maintain all permanent access roads, including drainage facilities, which are constructed for use during the period of construction. In the event that a road would be left in place, the OWNER and landowner may enter agreements regarding maintenance for erosion control following construction.

2.7.8. Any use damage to existing private roads, including rutting, resulting from construction operation shall be repaired and restored to condition as good or better than original as soon as possible. Repair and restoration should be accomplished during and following construction as necessary to reduce erosion.

2.7.9. All permanent access road surfaces, including those under construction, will be prepared with the necessary erosion control practices as determined by the STATE INSPECTOR or the managing agency prior to the onset of winter.

2.7.10 Any necessary snow removal shall be done in a manner to preserve and protect roads signs, and culverts, to ensure safe and efficient transportation, and to prevent excessive erosion damage to roads, streams, and adjacent land.

2.7.11. At the conclusion of line construction, final maintenance will be performed on all existing private roads used for construction access by the CONTRACTOR. These roads will be returned to a condition as good or better than when construction began.

2.7.12. At least ~~60~~30 days prior to construction of a new access road approach intersecting a state or federal highway, or of any structure encroaching upon a highway right-of-way, the OWNER shall submit ~~to the STATE INSPECTOR~~ to DOH a plan and profile map showing the location of the proposed construction. ~~The STATE INSPECTOR shall arrange for inspection of the site by the Department of Highways.~~ At least five days prior to construction, ~~T~~the OWNER shall ~~comply with any modifications recommended by the STATE INSPECTOR following this inspection~~provide the STATE INSPECTOR written documentation of this consultation and actions to be taken by the OWNER as provided in 2.6.1.

2.8. EQUIPMENT OPERATION

2.8.1. During construction, unauthorized cross-country travel and the development of roads other than those approved shall be prohibited. The OWNER shall be liable for any damage, destruction, or disruption of private property and land caused by his construction personnel and equipment as a result of unauthorized cross-country travel and/or road development.

2.8.2. To prevent excessive soil damage in areas where a graded roadway has not been constructed, the limits and locations of access for construction equipment and vehicles shall be clearly marked or specified at each new site before any equipment is moved to the site. Construction foremen and personnel should be well versed in recognizing these markers and shall understand the restriction on equipment movement that is involved.

2.8.3. Dust control measures shall be implemented on access roads where required by the managing agency or where dust would pose a nuisance to residents. Construction activities and travel shall be conducted to minimize dust. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used. Oil or similar petroleum-derivatives shall not be used.

2.8.4. Work crew foremen shall be qualified and experienced in the type of work being accomplished by the crew they are supervising. Earthmoving equipment shall be operated only by qualified, experienced personnel. Correction of environmental damage resulting from operation of equipment by inexperienced personnel will be the responsibility of the OWNER. Repair of damage to a condition reasonably satisfactory to the landowner, managing agency, or, if necessary, DNRC, would be required.

2.8.5. Sock lines will be strung using methods which minimize disturbance of soils and vegetation. ~~Motorized overland vehicles shall be used to string socklines only where terrain warrants, or where it can be done from existing access roads. Areas where motorized vehicles can be used shall be jointly determined by the OWNER, the STATE INSPECTOR, and the landowner.~~

2.8.6. Following construction in areas designated by the local weed control board as noxious weed area (Appendix F), the CONTRACTOR shall thoroughly clean all vehicles and equipment to remove weed parts and seeds immediately prior to leaving the area.

2.9 RIGHT-OF-WAY CLEARING AND SITE PREPARATION

2.9.1. The STATE INSPECTOR shall be notified at least ten days prior to any timber clearing. The STATE INSPECTOR shall be responsible for notifying the DSL Forestry Division.

2.9.2. During clearing of survey lines or the right-of-way, shrubs shall be preserved to the greatest extent possible. Shrub removal shall be limited to crushing where possible or cutting where necessary. Plants may be cut off at ground level, leaving roots undisturbed so that they may resprout.

2.9.3. Right-of-way clearing shall be kept to the minimum necessary ~~to allow construction access and to ensure that the line will operate as designed~~meet the requirements of the National Electric Safety Code. Trees to be saved within the clearing backlines and danger trees located outside the clearing backlines shall be marked. Clearing backlines in SENSITIVE AREAS will be indicated on plan and profile maps. All snags and old growth trees that do not endanger the line or maintenance equipment shall be preserved. In designated SENSITIVE AREAS, the STATE INSPECTOR shall approve clearing boundaries prior to clearing.

2.9.4. In no case should the entire nominal width of the right-of-way be cleared of trees up to the edge, unless approved by the STATE INSPECTOR and the landowner. Clearing should instead produce a "feathered edge" right-of-way configuration, where only specified hazard trees and those that interfere with construction or conductor clearance are removed. In areas where there is potential for long tunnel views of transmission lines or access roads as described in Appendix A, special care shall be taken to screen the lines from view. Where appropriate, special care shall be taken to leave a separating screen of vegetation where the right-of-way parallels or crosses highways and rivers.

2.9.5. During construction, care will be taken to avoid damage to ~~S~~small trees and shrubs on the right-of-way that do not interfere with the ~~powerline and~~ clearing requirements under 2.9.3. and would not grow to create a problem over a ten-year period. ~~should be allowed to grow on the right-of-way and beneath the conductors. Young growth or trees left standing shall be protected.~~

2.9.6. Soil disturbance and earth moving will be kept to a minimum.

2.9.7. ~~No timber shall be cut or destroyed outside the right-of-way without first obtaining permission from the landowner.~~ The OWNER shall be held liable for any unauthorized cutting, injury or destruction to timber whether such timber is on or off the right-of-way.

2.9.8. Unless otherwise requested by the landowner or managing agency, felling shall be directional in order to minimize damage to remaining trees. Maximum stump height shall be no more than 12 inches on the uphill side or 1/3 the tree diameter, whichever is greater. Trees will not be pushed or pulled over. Stumps will not be removed unless they conflict with a structure, anchor, or roadway.

2.9.9 Special logging, clearing, or excavation techniques may be required in certain highly sensitive or fragile areas, as listed in Appendix A.

2.9.10. Crane landings shall not be constructed on level ground unless extreme conditions (such as soft or marshy ground) make such construction necessary. In areas where ~~Construction of~~ more than one crane landing per tower site would be built, ~~will require prior approval of~~ the STATE INSPECTOR will be notified at least 5 days prior to the beginning of construction at those sites.

2.9.11. No motorized travel on, scarification of, or displacement of talus slopes shall be allowed except where approved by the STATE INSPECTOR and landowner or managing agency.

2.9.12. To avoid unnecessary ground disturbance, counterpoise should be placed or buried in disturbed areas whenever possible.

2.9.13. Slash resulting from project clearing that may be washed out by high water the following spring shall be removed and piled outside the floodplain before ~~December 1~~runoff. Instream slash resulting from project clearing must be removed within 24 hours.

2.9.14. Streamside trees will be felled away from streams rather than into or across streams.

2.10 GROUNDING

Grounding of fences, buildings, and other structures on and adjacent to the right-of-way shall be done according to the specifications of the National Electric Safety Code and any other specifications listed in Appendix G.

2.11 EROSION AND SEDIMENT CONTROL

2.11.1. Clearing and grubbing for roads and rights-of-way and excavations for stream crossings shall be carefully controlled to minimize silt or other water pollution downstream from the rights-of-way. Sediment retention basins will be installed as required by the STATE INSPECTOR or ~~the landowner~~managing agency.

2.11.2. Roads shall cross drainage bottoms at sharp or nearly right angles and level with the streambed whenever possible. Use of temporary bridges, fords, culverts, or other structures to avoid stream bank damage is required at the crossings listed in Appendix H.

2.11.3. Under no circumstances shall streambed materials be removed for use as backfill, embankments, road surfacing, or for other construction purposes.

2.11.4. No excavations shall be allowed on any river or perennial stream channels or floodways at locations likely to cause detrimental erosion or offer a new channel to the river or stream at times of flooding.

2.11.5. Installation of culverts, bridges, or other structures in perennial streams will be done with normal construction procedures following on-site inspections with DNRC and DFWP ~~and approval by the STATE INSPECTOR~~. All culverts shall be installed with the culvert inlet and outlet at natural stream grade or ground level. Water velocities or positioning of culverts shall not ~~be such that~~ impair fish passage ~~is impaired~~.

2.11.6. ~~At least 60 days prior to the c~~Construction of access roads, bridges, fill slopes, culverts, or impoundments, or channel changes within the high-water mark of any perennial stream, lake, or pond~~,~~ requires consultation with DFWP and local conservation district and application of applicable water quality standards. Within 15 days prior to start of construction, the OWNER shall submit written documentation that consultation has occurred. Included in this documentation should be the recommendation of the agencies consulted and the actions that OWNER expects to take to completely implement them.~~the OWNER shall submit to the STATE INSPECTOR the following: location of the activity and property boundaries on plan and profile maps or photo mosaics; dates of proposed construction; names and addresses of surrounding property owners; and culvert size and description of proposed construction activity including culvert and bridge size (where applicable) and method of size determination. Within 30 days of the submission of this material, the STATE INSPECTOR will arrange a site inspection, if necessary, with the OWNER and representatives of MDFWP and the local Conservation District. The OWNER will comply with any construction stipulations or procedures recommended by the STATE INSPECTOR following this field inspection. If the STATE INSPECTOR determines that construction activity will result in a significant increase in turbidity, then the STATE INSPECTOR shall contact the OWNER and DHES to discuss options for compliance with Montana Water Quality Standards.~~

2.11.7. No blasting shall be allowed in streams. Blasting may be allowed near streams if precautions are taken to protect the stream from debris and from entry of nitrates or other contaminants into the stream.

2.11.8. The OWNER shall maintain private roads while using them. All ruts made by machinery shall be filled or graded to prevent channeling. In addition, the OWNER must take measures to prevent the occurrence of erosion caused by wind or water during and after use of these roads. Some erosion-preventive measures include but are not limited to installing or using cross logs, drain ditches, water bars, and wind erosion inhibitors such as water, straw, gravel, or combinations of these.

2.11.9. The OWNER shall prevent material from being deposited in any watercourse or stream channel. Where necessary, measures such as hauling of fill material, construction of temporary barriers, or other approved methods shall be used to keep excavated materials and other extraneous materials out of watercourses. Any such materials entering watercourses shall be removed immediately.

2.11.10. The OWNER shall be responsible for the stability of all embankments created during construction. Embankments and backfills shall contain no stream sediments, frozen material, large roots, sod, or other materials which may reduce their stability.

2.11.11. Culverts, arch bridges, or other stream crossing structures shall be installed at all permanent crossings of flowing or dry watercourses where fill is likely to wash out during the life of the road~~, as specified in Appendix H~~. Culvert or bridge installation is prohibited in areas of important fish spawning beds identified by MDFWP and during specified fish spawning seasons on less sensitive streams or rivers. All culverts shall be big enough to handle approximately 15-year floods~~, as specified in Appendix H~~. Culvert size shall be determined by standard procedures which take into account the variations in vegetation and climatic zones in Montana, the amount of fill, and the drainage area above the crossing, and shall be approved as specified in 2.11.6. All culverts shall be installed at the time of road construction. The areas where stream crossing measures must be taken are listed in Appendix H.

2.11.12. No fill material other than that necessary for road construction shall be piled within the high water zone of streams where floods can transport it directly into the stream. Excess floatable debris shall be removed from areas immediately above crossings to prevent obstruction of culverts or bridges during periods of high water.

2.11.13. No skidding of logs or driving of vehicles across a perennial watercourse shall be allowed, except via authorized construction roads.

2.11.14. No perennial watercourses shall be permanently blocked or diverted.

2.11.15. Skidding with tractors shall not be permitted within 100 feet of streams containing flowing water except in places designated in advance, and in no event shall skid roads be located on these streamcourses. Skid trails shall be located high enough out of draws, swales, and valley bottoms to permit diversion of runoff water to natural undisturbed forest ground cover.

2.11.16. Construction methods shall prevent accidental spillage of solid matter, contaminants, debris, petroleum products, and other objectionable pollutants and wastes into watercourses, lakes, and underground water sources. Catchment basins capable of containing the maximum accidental spill shall be installed at areas where fuel, chemicals or oil are stored. Any accidental spills of such materials shall be cleaned up immediately.

~~2.11.17. Construction equipment service areas shall be as approved by the landowner but shall not be located within a 100-year floodplain as designated by the Engineering Bureau, Water Resources Division, DNRC.~~

2.11.~~18~~17. To reduce the amount of sediment entering streams, a strip of undisturbed vegetation will be provided between areas of disturbance (road construction or tower construction) and streamcourses, and around first order or larger streams that have a well-defined streamcourse or aquatic or riparian vegetation, unless otherwise required by the landowner. Buffer strip width is measured from the high water line of a channel and will be as determined by the STATE INSPECTOR and managing agency, using Table 1 as a guideline. For braided streams with more than one discernible channel (ephemeral or permanent) the high water line of the outermost channel is used. In the event that vegetation cannot be left undisturbed, structural sediment containment, approved by the STATE INSPECTOR, must be substituted before soil disturbing activity commences.

Table 1
Recommended Buffer-Filter Strip Widths From High Water Line of Stream

Land Slope	For Stable Soils Non-Fishery Streams (Feet)	For Fishery Stream or Sensitive Soils* With Dissected Slopes (Feet)
0 %	25	50
10 %	45	90
20 %	65	130
30 %	85	170
40 %	105	210
50 %	125	250
60 %	145	290
70 %	165	330

*Designated in Appendix A.

2.11.~~19~~18. When no longer needed, all temporary structures or fill installed to aid stream crossing shall be removed and the course of the stream reestablished to prevent future erosion.

2.11.~~20~~19. All temporary dams built on the right-of-way shall be removed after line construction unless otherwise approved by the STATE INSPECTOR. Dams allowed to remain shall be upgraded to permanent structures and shall be provided with spillways or culverts and with a continuous sod cover on their tops and downstream slopes. Spillways may be protected against erosion with riprap or equivalent means.

2.11.~~21~~20. Damage resulting from erosion or other causes shall be repaired after completion of grading and before revegetation is begun.

2.11.~~22~~21. Point discharge of water will be dispersed in a manner to avoid erosion or sedimentation of streams.

2.11.~~23~~22. Riprap or other erosion control activities will be planned based on possible downstream consequences of activity, and during the low flow season if possible.

2.11.~~24~~23. Water used in embankment material processing, aggregate processing, concrete curing, foundation and concrete lift cleanup, and other waste water processes shall not be discharged into surface waters without a valid discharge permit from DHES.

2.12 ARCHAEOLOGICAL, HISTORICAL AND PALEONTOLOGICAL RESOURCES ~~ARCHAEOLOGY AND HISTORY~~

2.12.1. All construction activities shall be conducted so as to prevent damage to ~~areas known to be or likely to be of~~ significant archaeological, historical, or paleontological ~~significance~~resources, in accordance with the requirements of 1.4.1 and Appendix I.

2.12.2. Any relics, artifacts, fossils or other items of historical, paleontological, or archaeological value shall be preserved in a manner agreeable to both the landowner and the State Historic Preservation Officer. If any such items are discovered during construction, SHPO shall be notified immediately. ~~and all~~ wWork which could disturb the materials or surrounding area must cease until the site can be properly evaluated by a qualified archaeologist (either employed by the OWNER or representing SHPO) and recommendations made by that person based on the Historic Preservation Plan outlined in Appendix I (but in no case more than 10 days). For significant sites, Rrecommendations of the State Historic Preservation Officer must be followed by the OWNER.

2.12.3. The OWNER shall conform to treatments recommended for cultural resources by either the Montana State Historic Preservation Office (SHPO) or the Advisory Council on Historic Preservation (ACHP), as specified in Appendix I.

2.13 PREVENTION AND CONTROL OF FIRES

2.13.1. Burning, fire prevention, and fire control shall comply with the burning plan and fire plan in Appendix J. These plans shall meet the requirements of the managing agency and/or the fire control agencies having jurisdiction. The STATE INSPECTOR shall be invited to attend all meetings with these agencies to discuss or prepare these plans. The STATE INSPECTOR, in turn, shall notify DSL of all such meetings.

2.13.2. The OWNER shall direct the CONTRACTOR to comply with regulations of any county, town, state or governing municipality having jurisdiction regarding fire laws and regulations.

2.13.3. Blasting caps and powder shall be stored only in approved areas and containers and always separate from each other.

2.13.4. The OWNER shall direct the CONTRACTOR to properly store and handle combustible material which could create objectionable smoke, odors, or fumes. The OWNER shall direct the CONTRACTOR not to burn refuse such as trash, rags, tires, plastics, or other debris, except as permitted by the county, town, state, or governing municipality having jurisdiction.

~~**2.13.5. Failure of the OWNER to properly clean up and dispose of slash will be cause for forfeiture of the RESTORATION BOND.**~~

2.14 WASTE DISPOSAL

2.14.1. The OWNER shall direct the CONTRACTOR to use licensed solid waste disposal sites. Inert materials (Group III wastes) may be disposed of at Class III landfill sites; mixed refuse (Group II wastes) must be disposed of at Class II landfill sites.

2.14.2. Emptied pesticide containers or other chemical containers must be triple rinsed to render them acceptable for disposal in Class II landfills or for scrap recycling pursuant to ARM 16.44.202(12) for treatment or disposal. Pesticide residue and pesticide containers shall be disposed of in accordance with ARM 16.20.633(9).

2.14.3. All waste materials constituting a hazardous waste defined in ARM 16.44.303, and wastes containing any concentration of polychlorinated biphenyls must be transported to an approved designated hazardous waste management facility (as defined in ARM 16.44.202(12) for treatment or disposal.

2.14.4. All used oil shall be hauled away and recycled or disposed of in a licensed Class II landfill authorized to accept liquid wastes or in accordance with 2.14.2 and 2.14.3 above. There shall be no intentional release of crankcase oil or other toxic substances into streams or soil. In the event of an accidental spill into a waterway, the substances will be cleaned up and the Water Quality Bureau, DHES, will be contacted immediately.

2.14.5. Sewage shall not be discharged into streams or streambeds. The OWNER shall direct the CONTRACTOR to provide refuse containers and sanitary chemical toilets, convenient to all principal points of operation. These facilities shall comply with applicable federal, state, and local health laws and regulations.

2.14.6. In order to reduce fire hazard, small trees and brush cut during construction should be chipped, burned, and/or scattered. Slash 3 inches in diameter or greater may be scattered in quantities of up to 15 tons/acre unless otherwise requested by the landowner. Tops, limbs and brush less than 3 inches in diameter and 3 feet in length may be left in quantities less than 3 tons per acre except on cropland and residential land or where otherwise specified by the landowner. In certain cases the STATE INSPECTOR will authorize chipping and scattering of tops, limbs and brush in excess of 3 tons per acres as an erosion control measure. Merchantable timber should be decked and removed at the direction of the landowner or managing agency.

2.14.7. Refuse burning shall require the prior approval of the landowner and a Montana Open Burning Permit must be obtained from MDHES. Any burning of wastes shall comply with section 2.13 of these specifications.

2.15 SPECIAL MEASURES

2.15.1. Natural wood colored structures (poles) should be used to reduce potential for visual contrast.

2.15.2. Crossings of rivers should be at right angles. Strategic placement of structure should be done both as a means to screen views of the transmission line and to minimize the need for vegetative clearing.

3.0 POST-CONSTRUCTION CLEANUP AND RECLAMATION

3.1 CLEANUP

3.1.1. All litter resulting from construction is to be removed, to the satisfaction of the landowner, from the right-of-way and along access roads leading to the right-of-way. Such litter shall be legally disposed of as soon as possible, but in no case latter than within 60 days of completion of wire clipping. If requested by the landowner, the OWNER shall provide for removal of any additional construction-related debris discovered after this initial cleanup.

3.1.2. Insofar as practical, all signs of temporary construction facilities such as haul roads, work areas, buildings, foundations or temporary structures, stockpiles or excess or waste materials, or any other vestiges of construction shall be removed and the areas restored to as natural a condition as is practical, in consultation with the landowner.

3.2 RESTORATION, RECLAMATION, AND REVEGETATION

3.2.1. Restoration, reclamation, and revegetation of the right-of-way, access roads, crane pads, splicing or stringing sites, borrow sites, gravel, fill, stone, or aggregate excavation, or any other disturbance shall be in accordance with the Reclamation and Revegetation Plan in Appendix K. ~~The STATE INSPECTOR, the managing agency, and the contracting officer shall be invited to attend all meetings to discuss or prepare this plan.~~ The OWNER may choose to develop this plan in consultation with appropriate land management agencies as part of easement negotiations. In this case, the OWNER shall provide written documentation of consultation with those agencies and a copy of the agreed-to plan. This plan and any conditions approved by the BOARD shall be attached as Appendix K. Failure of the OWNER to comply with this plan shall be cause for forfeiture of the RESTORATION or RECLAMATION BONDS.

3.2.2. Scarring or damage to any landscape feature listed in Appendix A shall be restored as nearly as practical to its original condition. Bare areas created by construction activities will be reseeded in compliance with Appendices K and L to prevent soil erosion.

3.2.3. After construction is complete, and in cooperation with the landowner, temporary roads shall be closed as specified in Appendix M.

3.2.4. In agricultural areas where soil has been compacted by movement of construction equipment, the OWNER shall direct the CONTRACTOR to rip the soil deep enough to restore productivity, or if complete restoration is not possible, the OWNER shall compensate the landowner for lost productivity.

3.2.5. Earth next to access roads that cross streams shall be replaced at slopes less than the normal angle of repose for the soil type involved.

3.2.6. All drainage channels shall be restored to a gradient and width which will prevent accelerated gully erosion.

3.2.7. Drive-through dips, open-top box culverts, waterbars, or cross drains shall be added to roads at the proper spacing and angle as necessary to prevent erosion.

3.2.8. Sidecasting of waste materials may be allowed on slopes over 40 percent after approval by the landowner; however, this will not be allowed within the buffer strip established for stream courses, in areas of high or extreme soil instability, or in other SENSITIVE AREAS identified in Appendix A. Surplus materials shall be hauled to landowner-approved sites in such areas.

3.2.9. Interrupted drainage systems shall be restored.

3.2.10. Seeding prescriptions to be used in revegetation, requirements for hydroseeding, fertilizing, and mulching, as jointly determined by representatives of the OWNER, DNRC, DSL, and other involved state and federal agencies, are specified in Appendix L.

3.2.11. Piling and windrowing of material for burning shall use methods that will prevent significant amounts of soil from being included in the material to be burned and minimize destruction of ground cover. Non-mechanized methods are recommended if necessary to minimize soil erosion and vegetation disturbance. Piles shall be located so as to minimize danger to timber and damage to ground cover when burned.

3.2.12. During restoration in areas where topsoil has been stockpiled, the site will be graded to near natural contours and the topsoil will be replaced on the surface.

3.2.13. Excavated material not suitable or required for backfill shall be evenly filled back onto the cleared area prior to spreading any stockpiled soil. Large rocks and boulders uncovered during excavation and not buried in the backfill will be disposed of as approved by the STATE INSPECTOR and/or the landowner.

3.2.14. Application rates and timing of seeds and fertilizer, and purity and germination rates of seed mixtures, shall be as specified in Appendix K. Reseeding shall be done at the first appropriate opportunity after construction ends ~~for each segment of the line~~as specified in Appendix K, or as determined by the landowner or managing agency.

3.2.15. Where appropriate, hydroseeding, drilling, or other appropriate methods shall be used to aid revegetation. Mulching with straw, wood chips, or other means shall be used where necessary. Areas requiring such treatment are listed in Appendix L.

3.2.16. All temporary roads shall be obliterated and reclaimed (with the concurrence of the landowner), as specified in Appendix M. All temporary roadways shall be graded and scarified as specified to permit the growth of vegetation and to discourage traffic. Permanent unsurfaced roadbeds not open to public use will be revegetated as soon after use as possible unless specified otherwise by the landowner.

3.3 MONITORING

3.3.1. Upon notice by the OWNER, the STATE INSPECTOR will immediately schedule initial post-construction field inspections following clean up and road closure. Follow-up visits will be scheduled as required to monitor the effectiveness of erosion controls, reseeding measures, and the right-of-way management plan (Appendix N).

The STATE INSPECTOR will contact the landowner for post-construction access and to determine landowner satisfaction with the OWNER'S restoration measures. Revegetation objectives shall be consistent with Section 2.1.23 of these Guidelines.

The STATE INSPECTOR shall document observations for inclusion in reports to the BOARD regarding bond release or the success of mitigation measures required by the BOARD.

3.3.2. Success of revegetation shall be based on criteria specified in the reclamation and revegetation plan (Appendix K).

3.3.3. Failure of the OWNER to adequately reclaim all disturbed areas in accordance with section 3.2. and Appendix K of these specifications shall be cause for forfeiture of the RECLAMATION BOND.

4.0 OPERATION AND MAINTENANCE

4.1 RIGHT-OF-WAY MANAGEMENT AND ROAD MAINTENANCE

4.1.1. Maintenance of the right-of-way and permanent access roads shall be as specified in the right-of-way management plan (Appendix N). This plan shall provide for the protection of SENSITIVE AREAS identified prior to and during construction.

4.1.2. Vegetation that has been saved through the construction process and which does not pose a hazard or potential hazard to the powerline, particularly that of value to fish and wildlife, as specified in Appendix A, shall be allowed to grow on the right-of-way.

4.1.3. In areas other than cropland, vegetative cover shall be maintained in the areas immediately adjacent to transmission towers in cooperation with the landowner.

4.1.4. Grass cover, water bars, cross drains, and the proper slope shall be maintained on permanent access roads and service roads in order to prevent soil erosion.

4.2 MAINTENANCE INSPECTIONS

4.2.1. ~~Inspection and ground maintenance activities of the powerline shall include observations of soil erosion problems, and conditions of the vegetation on the right-of-way or access roads that require attention.~~ The OWNER shall have responsibility to correct soil erosion or revegetation problems on the right-of-way or access roads as they become known. Appropriate corrective action will be taken where necessary. The OWNER may, through agreement with the landowner or managing agency, provide a mechanism to identify and correct such problems.

4.2.2. Operation and maintenance inspections using ground vehicles shall be timed so that routine maintenance will be done when access roads are firm, dry or frozen, wherever possible. Maintenance vegetative clearing shall be done according to criteria spelled out in Appendix N.

4.3 CORRECTION OF LANDOWNER PROBLEMS

~~4.3.1. For transmission lines of a design voltage of 345 kV and above, the OWNER shall advise all known beekeepers along the proposed final route of the known effects of induced voltages on bees and of the mitigation measures that may be required if hives are located under the lines. If necessary, the OWNER shall assist the beekeepers in relocating hives prior to energizing the transmission line. If beehives are placed on the right-of-way during operation, the OWNER shall inform the beekeeper that honey production may be affected.~~

4.3.~~2~~1. When the facility causes interference with radio, TV, or other stationery communication systems after the facility is energized, the OWNER will correct the interference with mechanical corrections to facility hardware, or antennas, or will install remote antennas or repeater stations, or will use other reasonable means to correct the problem.~~When radio or TV interference is documented to occur as a result of the construction or operation of the transmission line, the OWNER will resolve the problems in a manner satisfactory to the landowners.~~

4.3.~~3~~2. The OWNER will respond to complaints of interference by investigating complaints to determine the origin of the interference. If the interference is not caused by the facility, the OWNER shall so inform the person bringing the complaint. The OWNER shall provide the STATE INSPECTOR with documentation of the evidence regarding the source of the interference if the person brings the complaint to the STATE INSPECTOR or the BOARD.

4.4 HERBICIDES AND WEED CONTROL

4.4.1. Weed control, including any application of herbicides in the right-of-way, will be in accordance with recommendations of the Montana Department of Agriculture, and in accordance with the right-of-way maintenance plan in Appendix N.

4.4.2. Herbicides will not be used in certain areas identified by DNRC, MDFWP, and DHES, as listed in Appendix O or as requested by the landowner.

4.4.3. Proper herbicide application methods will be used to keep drift and nontarget damage to a minimum.

4.4.4. Herbicides must be applied according to label specifications and in accordance with 4.4.1. above. Only herbicides registered in compliance with applicable federal and state laws may be applied.

4.4.5. Herbicides shall not be sprayed during heavy rains or threat of heavy rains. Vegetative buffer zones shall be left along all identifiable stream channels. Herbicides shall not be used in any public water supply watershed identified by the DHES or listed in Appendix O.

4.4.6. In areas disturbed by transmission facilities, the OWNER will cooperate with landowners in control of noxious weeds as designated by the weed control board having jurisdiction in the county crossed by the line.

4.4.7. The OWNER shall notify the STATE INSPECTOR in writing 30 days prior to any broadcast or aerial spraying of herbicides. The notice shall provide details as to the time, place, and justification for such spraying. DNRC, DFWP, DHES, and the Montana Department of Agriculture shall have the opportunity to inspect the portion of the ROW or access roads scheduled for such treatment before, during, and after spraying.

4.4.8. All applications of herbicides must be performed by a licensed applicator.

4.4.9 During the second and third growing seasons following the completion of restoration and reseeding, the OWNER and STATE INSPECTOR shall inspect the right-of-way and access roads for newly-established stands of noxious weeds. The county weed control supervisor shall be invited to attend this inspection. In the event that stands of weeds are encountered, appropriate control measures shall be taken by the OWNER.

4.5. MONITORING

4.5.1. DNRC may continue to monitor operation and maintenance activities for the life of the project in order to ensure compliance with the specifications in this section.

4.5.2. The OWNER will be responsible to DNRC for the term of the RECLAMATION BOND (section 0.7). After this time the OWNER will report to individual landowners and managing agencies except as specified in conditions to the certificate.

4.5.3. Upon reasonable complaint from an affected landowner or managing agency, DNRC may require the OWNER to fund additional monitoring efforts to resolve problems which develop after release of the BONDS. Such efforts would be limited to compliance with these specifications and other conditions adopted by the BOARD.

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